



Forum Guide to College and Career Ready Data



- Individual Learning Plan
- Program of Study
- Advanced Placement
- Dual Enrollment
- Internship
- College Entrance Exam
- Industry Certification
- College Applications
- Financial Aid Applications
- Employment Applications



National Forum on Education Statistics



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National Forum on Education Statistics

National Cooperative Education Statistics System

The National Center for Education Statistics (NCES) established the National Cooperative Education Statistics System (Cooperative System) to assist in producing and maintaining comparable and uniform information and data on early childhood, elementary, and secondary education. These data are intended to be useful for policymaking at the federal, state, and local levels.

The National Forum on Education Statistics (Forum) is an entity of the Cooperative System and, among its other activities, proposes principles of good practice to assist state and local education agencies in meeting this purpose. The Cooperative System and the Forum are supported in these endeavors by resources from NCES.

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National Forum on Education Statistics

The work of the Forum is a key aspect of the National Cooperative Education Statistics System. The Cooperative System was established to produce and maintain, with the cooperation of the states, comparable and uniform education information and data that are useful for policymaking at the federal, state, and local levels. To assist in meeting this goal, the National Center for Education Statistics (NCES), within the U.S. Department of Education, established the Forum to improve the collection, reporting, and use of elementary and secondary education statistics. The Forum deals with issues in education data policy, sponsors innovations in data collection and reporting, and provides technical assistance to improve state and local data systems.

Development of Forum Products

Members of the Forum establish working groups to develop best practice guides in data-related areas of interest to federal, state, and local education agencies. They are assisted in this work by NCES, but the content comes from the collective experience of working group members who review all products iteratively throughout the development process. After the working group completes the content and reviews a document a final time, publications are subject to examination by members of the Forum standing committee that sponsors the project. Finally, Forum members (approximately 120 people) review and formally vote to approve all documents prior to publication. NCES provides final review and approval prior to online publication. The information and opinions published in Forum products do not necessarily represent the policies or views of the U.S. Department of Education or NCES.

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About This Guide

The National Forum on Education Statistics (Forum) organized the College and Career Ready (CCR) Working Group to explore how state and local education agencies (SEAs and LEAs) can use data to support college and career readiness initiatives. The working group determined that high-quality data in integrated K12, postsecondary, and workforce data systems can be of value to all CCR stakeholders when they are used to

- foster individualized learning for students;
- support educators in identifying and addressing student-specific needs;
- guide CCR programmatic decisions through the use of postsecondary feedback loops;
- measure progress made by education agencies in achieving CCR accountability and continuous improvement goals; and
- maximize career opportunities for all students.

Through the presentation of five data use cases related to these goals, this document can serve as a practical guide for determining the appropriate data elements, metrics, and reporting tools needed to support specific CCR initiatives within SEAs and LEAs.

Intended Audience

The *Forum Guide to College and Career Ready Data* is intended for anyone with an interest in preparing K12 students to be college and career ready. SEA and LEA staff who are responsible for the data needed to support CCR initiatives and metrics, or those who manage CCR programs, may find this guide especially useful. The higher education and workforce communities may also find this guide helpful as they partner with K12 agencies in designing and implementing CCR initiatives and supporting data systems.

Common CCR Terms

ACT® – a college readiness assessment administered by ACT, Inc.

Advanced Placement (AP) – a program created and administered by the College Board that offers college-level curricula and examinations to high school students. Postsecondary institutions often grant college credit to students admitted to their institutions who scored at a certain level on AP examinations. Not all high schools offer AP courses. For a high school course to earn the AP designation, the course must be audited by the College Board to confirm that it satisfies the AP curriculum requirements.

Career Cluster – a group of related jobs and industries. The National Career Clusters® Framework has defined 16 Career Clusters that include more than 79 Career Pathways.

Career Pathway – a coherent, articulated sequence of rigorous academic and career/technical courses, commencing in the ninth grade and leading to an associate degree, baccalaureate degree and beyond, an industry-recognized certificate, and/or licensure (Hull, 2005). Similar to Career Pathways, Programs of Study, as required under the Perkins Act, define the education requirements spanning high school and postsecondary that lead to an industry-recognized credential, a postsecondary certificate, or an associate or baccalaureate degree in a student's chosen field.

Career and Technical Education (CTE) – a term applied to schools, institutions, and educational programs that specialize in preparing students for careers primarily in skilled trades, applied sciences, or modern technologies. As most CTE professions are increasingly requiring some postsecondary education, CTE programs should offer the academic rigor necessary to prepare students for postsecondary learning.

Career and Technical Education (CTE) Concentrator – a student who takes a certain number of credits (the specific number is defined by the state) in a single CTE program area.

Career and Technical Education (CTE) Non-Concentrator – a student who takes CTE classes but does not reach the threshold of credits earned in a single CTE program to be considered a CTE concentrator.


College and Career Readiness (CCR) – as defined by the Forum CCR Working Group, a student is college and career ready when he or she has attained the knowledge, skills, and disposition needed to succeed in credit-bearing (non-remedial) postsecondary coursework or a workforce training program in order to earn the credentials necessary to qualify for a meaningful career aligned to his or her goals and offering a competitive salary.

Dual Enrollment – an enrollment agreement in which a high school student takes a course at a postsecondary institution and earns both high school credit and postsecondary credit upon successful course completion.

Early Warning System – a data-based tool that uses specific indicators to identify students who may not be on course to meet their education goals.

ESEA – Elementary and Secondary Education Act.

FAFSA – Free Application for Federal Student Aid.



Individualized Learning Plan (ILP) – a student-directed planning and self-monitoring tool that may be used with students in grades 6-12. The plan includes the student’s long-term education and career goals and identifies the coursework and activities needed for the student to reach those goals. ILPs may also be called Personalized Learning Plans (PLPs). ILPs are distinct from Individual Education Plans (IEPs), which are specific to programs provided under the Individuals with Disabilities in Education Act.

International Baccalaureate (IB) – a program of study for grades 3-12 designed and administered by the nonprofit International Baccalaureate Organization. Postsecondary institutions generally recognize IB programs as providing rigorous academic preparation for college.

Perkins Act – a federal statute that authorizes grants for CTE programs, most recently reauthorized as the Carl D. Perkins Career and Technical Education Improvement Act of 2006.

P-20W Data Governance – the overall management of the availability, usability, integrity, quality, and security of data across multiple state agencies responsible for preschool, K12, and postsecondary education as well as workforce programs.

Postsecondary Feedback Loop – the process in which postsecondary institutions share timely information with K12 education agencies regarding the enrollment and academic achievement of high school graduates enrolled at their institutions. This information is used by K12 agencies to determine the effectiveness of their instructional and support programs.

SAT® – a college readiness assessment administered by the College Board.

Soft Skills – the non-academic knowledge, skills, habits, and character traits needed to succeed in both college and the workplace, such as social and emotional skills and dispositions, and self-management skills. Soft skills are a subset of lifelong learning skills, which may also include technology skills, financial literacy and consumer skills, civic skills, higher order thinking skills, and the ability to apply knowledge in cross-disciplinary contexts.

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Chapter 1: Overview of College and Career Readiness

Why Is College and Career Readiness Important?

Today's global, knowledge-based economy requires a better-educated workforce than that of previous generations. In the manufacturing economy of the last century, a high school graduate could expect to earn a middle-class wage. In 1973, individuals with a high school education or less made up 72 percent of the nation's workforce. By 2007, despite significant growth in the overall number of jobs available, the percentage of jobs held by those with a high school diploma or less had fallen to 41 percent, with 59 percent of jobs requiring some level of postsecondary education (Symonds 2011). This trend is expected to continue. By 2020, 65 percent of all jobs will require some form of postsecondary education or training. It is estimated that 11 percent of all jobs will require a master's degree or higher; 24 percent will require a bachelor's degree; 12 percent will require an associate's degree; and 18 percent will require some postsecondary training or industry credential but no formal degree (Carnevale 2013). See Figures 1 and 2 on page 2.

When Is a Student College and Career Ready?

In light of current employment projections, state and local education agencies (SEAs and LEAs) are now being tasked not only to ensure that all students graduate from high school, but also to prepare students to be college and career ready (CCR) when they graduate. Most states have developed a definition of college and career readiness (see Appendix B). The Forum CCR Working Group developed the following definition of college and career readiness: A student is college and career ready when he or she has attained the knowledge, skills, and disposition needed to succeed in credit-bearing (non-remedial) postsecondary coursework or a workforce training program in order to earn the credentials necessary to qualify for a meaningful career aligned to his or her goals and offering a competitive salary.

“There is a persistent and growing mismatch between the skills that U.S. workers possess and the skills that U.S. businesses need. ... A nation's capacity to develop a skilled, prepared workforce is inextricably linked to the quality of its education system. ... To be clear, the U.S. education system is not getting worse — indeed, evidence suggests that it is improving. It is, however, failing to keep pace with both the demands of the modern global economy and the improvements observed in other nations” (Business Round Table 2013).

Figure 1. Percentage of Employment Opportunities by Educational Attainment in 1973

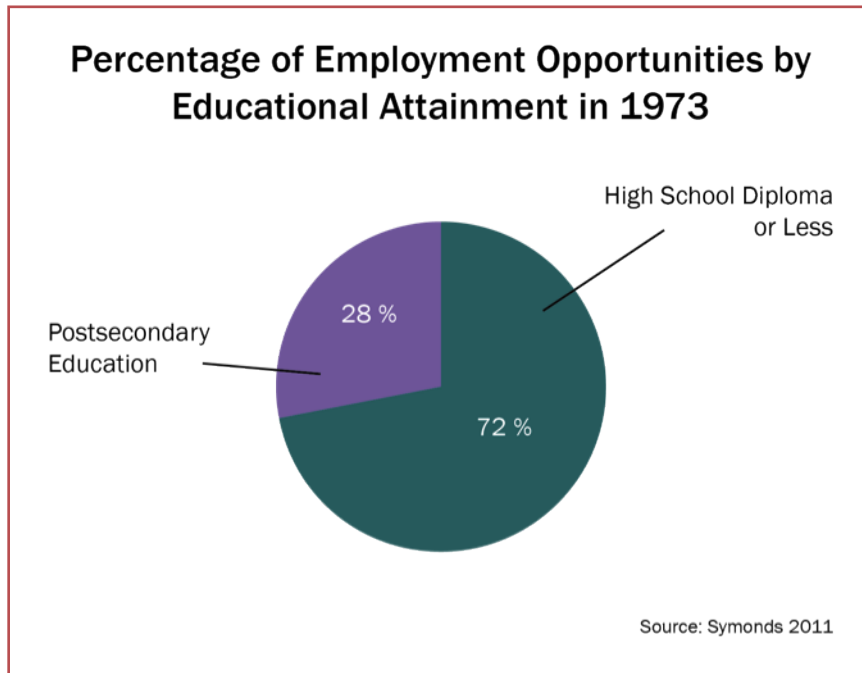
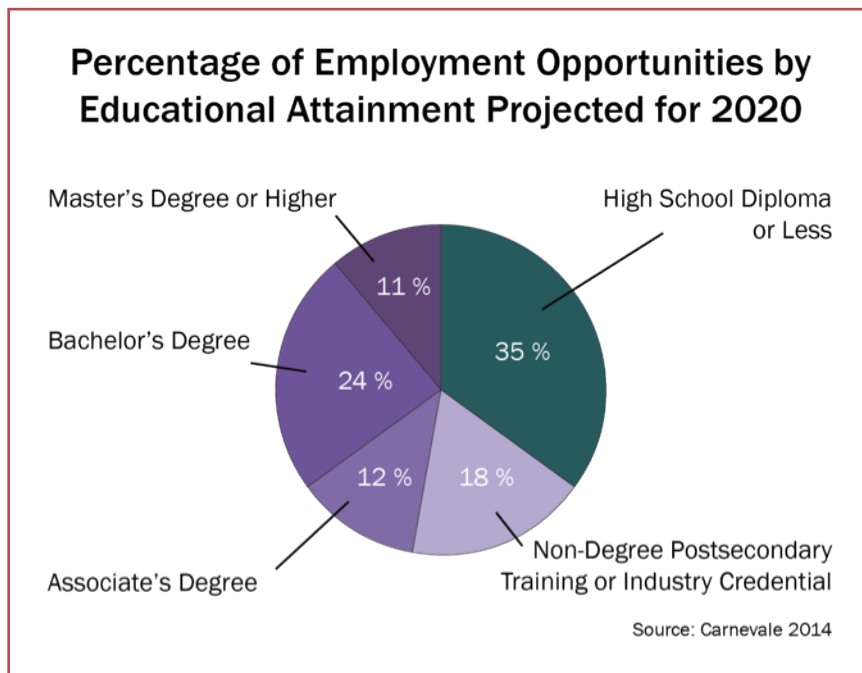


Figure 2. Percentage of Employment Opportunities by Educational Attainment Projected for 2020



How Many High School Graduates are College and Career Ready?

No standard measure for college and career readiness currently exists, so it is difficult to provide a national estimate on how many students graduate from high school ready for college and career. However, one commonly used indicator is the extent to which students who enroll in college can successfully complete credit-bearing coursework without the need for remedial classes. One study estimates that 20 percent of first-time college students require remedial coursework (NCES 2013b). Another potential measure of college and career readiness is the percentage of high school graduates applying for military service who are accepted. A 2010 study of high school graduates seeking to enter the military showed that 20 percent of those students did not pass the academic portion of the Armed Services Vocational Aptitude Battery (Education Trust 2010).

A student is college and career ready when he or she has attained the knowledge, skills, and disposition needed to succeed in credit-bearing (non-remedial) postsecondary coursework or a workforce training program in order to earn the credentials necessary to qualify for a meaningful career aligned to his or her goals and offering a competitive salary.

How Has the Education Community Responded?

Over the past 15 years, nongovernmental organizations (NGOs), government agencies, and state legislatures have been

- defining CCR learning standards;
- designing career pathways;
- enacting CCR legislation and accountability requirements; and
- implementing CCR programs and initiatives.

CCR Standards

Efforts to define the knowledge and skills in math and English that high school graduates need for success in credit-bearing college courses and high-growth jobs began in 2001. Led by NGOs, the two primary initiatives were the American Diploma Project and the Common Core State Standards.¹ The benchmarks and standards developed under these initiatives were made available for voluntary adoption by SEAs. In addition to specific learning standards in core academic subjects, other groups introduced standards for non-academic skills and knowledge needed for college and career readiness.² These latter efforts drew attention to the soft skills (e.g., social and emotional skills and dispositions) needed for student success in college and career.

Career Pathways

The career and technical education (CTE) community has an established history of building partnerships among K12, workforce, and postsecondary agencies. During the 2000s, the CTE community developed the concept of Career Pathways, defined as “a coherent, articulated sequence of rigorous academic and career/technical courses, commencing in

¹ The American Diploma Project was led by Achieve, Education Trust, the Thomas B. Fordham Institute, and the National Alliance of Business; the Common Core State Standards initiative was led by the National Governors Association and the Council of Chief State School Officers.

² In 2002, the Partnership for 21st Century Skills introduced a Framework for 21st Century Learning that outlined a set of skills necessary for student long-term success. In 2004, the American School Counselor Association published its National Standards for Students, encompassing standards for both academic and career development.

the ninth grade and leading to an associate degree, baccalaureate degree and beyond, an industry-recognized certificate, and/or licensure” (Hull 2005). Under the National Career Clusters® Framework, which serves as an organizing tool for curriculum design and instruction, there are 16 Career Clusters representing more than 79 Career Pathways. The 2006 reauthorization of the Carl D. Perkins Career and Technical Education Act included an expectation for grantee CTE programs to provide seamless educational paths linking academic and technical content from secondary through postsecondary education, similar to Career Pathways. These paths were termed Programs of Study, and later referred to as Rigorous Programs of Study (CORD 2012).


CCR Legislation

In 2006, Texas became the first state to mandate the development and use of CCR standards (SREB 2014). State CCR legislative requirements may include the adoption of specific CCR learning standards, the use of specific assessments, or the provision of certain types of coursework. They may also include non-academic requirements, such as Minnesota’s CCR legislative requirement that all students starting in ninth grade have an education plan around seven key elements: academic scheduling, career exploration, career- and employment-related skills, community partnerships, college access, all forms of postsecondary training, and experiential learning opportunities (MNDOE 2014).

In 2011 the U.S. Department of Education (ED) issued an invitation to chief state school officers to request flexibility in meeting some of the requirements of the No Child Left Behind Act in exchange for state-developed plans designed to improve educational outcomes for students. As described in the *Elementary and Secondary Education Act (ESEA) Flexibility* policy document, one of the four principles to which states must adhere in order to receive flexibility is “College and Career Ready Expectations for All Students” (ED 2011).

CCR Programs

With CCR expectations now embedded in many state and federal accountability requirements, SEAs and LEAs are working together and partnering with higher education and workforce agencies to implement a broad variety of CCR programs designed to support students and educators. Due to the pressure from policymakers for quick action, CCR programs are often implemented ad hoc rather than as part of a coherent plan. According to the ED-funded College and Career Readiness and Success Center (CCRSC), “the increased focus on college and career readiness, combined with the complexity of the challenges associated with the topic, have led to a rapidly expanding college and career readiness community, rich with resources yet replete with confusion” (CCRSC 2014). To help make sense of the emerging CCR landscape, the CCRSC developed the College and Career Readiness and Success Organizer (see Appendix C).



How Is the Focus on College and Career Readiness Impacting Education Data Systems?

In order for students to graduate from high school ready for success in college and career, they need information and planning tools to allow them to explore long-term college and career goals, identify what is needed to meet those goals, and measure their progress throughout high school. In turn, teachers and counselors at the school level, along with LEA, SEA, postsecondary, and workforce agency administrators, all have roles and responsibilities in supporting students in meeting their goals and ensuring that CCR programs are producing the desired results. This integrated support system requires integrated data systems with online resources and tools that provide access to timely data. A comprehensive CCR data system may not yet exist in one place, but components of the system can be found in various education agencies at various levels of functionality. The use cases presented in Chapter 2 can help identify the data elements, reporting and analysis tools, and data system connections that are needed to effectively use data to support an agency's CCR goals.

Chapter 2:

Using Data to Support College and Career Ready Goals

A comprehensive college and career ready (CCR) data system may not yet be fully defined, but by examining how state and local education agencies (SEAs and LEAs) are beginning to use data to support CCR initiatives, important components of a comprehensive system begin to emerge. In many cases, SEAs and LEAs are simply expanding or refocusing the ways in which they have been using data to promote student learning and increase high school graduation rates in order to support the broader goal of promoting college and career readiness. This chapter looks at how data can be used to support CCR goals in five specific ways, or use cases:

- fostering individualized learning for students;
- supporting educators in identifying and addressing student-specific needs;
- guiding CCR programmatic decisions through the use of postsecondary feedback loops;
- measuring the progress made by education agencies in achieving CCR accountability and continuous improvement goals; and
- maximizing career opportunities for all students.

Each of the five use cases presented in this chapter includes the following sections:

- an overview of the purpose for the use of data in each specific case;
- questions that can be answered by various stakeholders with access to the right data and analytics;
- key data needed to answer the questions;
- useful analytics, or indicators, that can be calculated using the key data to produce actionable information for stakeholders;
- considerations for obtaining user feedback and evaluating the data use;
- emerging needs related to the use case, such as access to new data, the use of new data tools, or new policies or practices that would promote improved usage;
- examples of how the use case is currently being operationalized; and
- sidebars of helpful information related to the use case.

Data needs, analytics, or other components may be similar across use cases. However, since each use case is written as a stand-alone resource for readers who may only be interested in one specific data use, the use cases each include full information for all sections.

Common Key Data Needs

Many of the use cases presented in this document share similar data needs, including the need for a teacher-student data link and coursetaking data. A teacher-student data link is required if one of the goals of the use case is to identify where teacher professional development may be needed. In general, the teacher-student data link will require identifying information for the specific class in which the student is enrolled, including the teacher of record.³

Four of the five use cases mention the need for coursetaking data. Course codes are typically used to consistently identify courses within schools, districts, and states. K12 agencies and postsecondary institutions need standardized course codes to facilitate the transfer of information between schools, districts, and states, as well as between K12 agencies and postsecondary institutions. The Forum's School Courses for the Exchange of Data (SCED) Classification System was developed to meet the need for standardized course codes.⁴

A master list of the key data needs referenced in the use cases is found in Appendix D as part of a CCR - Common Education Data Standards (CEDs) crosswalk. This list is not intended to serve as an exhaustive list of all data elements needed for CCR-related initiatives; rather, it is a list of data that are central to the specific use cases presented in this publication.

In addition to the key data needs listed within the use cases, most use cases require additional contextual information to answer the questions or conduct the analyses presented. This contextual information, together with the key data needs, can help to explain why some programs are producing mixed results in schools or LEAs within the state. Examples of contextual information include

- school and/or LEA demographics;
- school and/or LEA attendance and discipline data;
- school safety data;
- courses offered, including the availability of college-level coursework (e.g., honors, International Baccalaureate [IB], dual enrollment, Advanced Placement [AP]);
- teacher and/or counselor staffing levels;
- teacher postsecondary education and certification data;
- policies and programs that support college and career readiness;
- resources allocated for CCR efforts;
- alignment of high school graduation requirements and college entry requirements; and
- current workforce needs within a community.

³ For detailed information on teacher-student data links, see the 2013 Forum publication [Forum Guide to the Teacher-Student Data Link: A Technical Implementation Resource](#).

⁴ See the 2014 Forum publication [Forum Guide to School Courses for the Exchange of Data \(SCED\) Classification System](#).

Considerations for Effective Data Use

A number of overarching considerations for effective data use are applicable to all five use cases. These include the strategies employed for engaging and supporting all stakeholders and data users, the methods used to ensure data security and student privacy, the quality and availability of the data to users, and the maturity of the state's interagency data governance structure. These topics are discussed in Chapter 3.

Use Case #1: Tools to Support Individualized Learning

SEAs and LEAs can assist students in career exploration by providing them with information and tools to help them identify their personal career goals and the educational requirements for reaching those goals. Although student aspirations may change over time, the process of exploring career options can help students begin to focus on their long-term goals and the importance of education in meeting those goals. Tools allowing students to research career opportunities that match their individual talents and interests can guide them in making the appropriate decisions for coursetaking and extracurricular activities. Education plans can then be established to help them achieve their career goals. Career and technical education (CTE) uses this approach in its Career Pathways or Programs of Study, which articulate the high school and postsecondary education requirements that lead to employment or an apprenticeship program in a student's chosen field.

One tool gaining widespread use to support student CCR planning is the individualized learning plan (ILP), sometimes called a personalized learning plan. The ILP is typically developed for use by middle school or ninth-grade students in consultation with their parents, counselors, and teachers. The plan is intended to help articulate a student's long-term education and career goals and identify the necessary courses, grades, activities, demonstrated skills, and credentials needed to successfully meet those goals. By demonstrating the connection between students' long-term goals and their performance in high school, ILPs may help counter student perceptions that what they learn in school is not relevant to their lives after high school. ILPs are most effective when they are used in regular discussions between students and guidance counselors as a tool for ongoing progress monitoring rather than a one-time planning activity.

SEAs and LEAs are at different stages in implementing ILPs. Some states require the use of ILPs only for students at risk of not graduating, while other states are using ILPs as a resource for all students. Student ILPs may be on paper or online. Online ILPs vary in their functionality and may include links to career exploration websites as well as self-exploration activities to assist students in identifying their interests and talents. Some online ILPs are stand-alone electronic documents, which may require all data to be entered by the student. Others may be linked to district or state student information systems, allowing for some of the needed data to be populated automatically into the ILP.

ILPs are a resource for schools as well as students. Some ILP systems can generate aggregate reports on indicators such as the number of students selecting specific career

paths or planning to enroll in certain institutions of higher education. Powerful analytics are possible with an ILP system that populates student ILPs with data from a student information system (such as a student's coursetaking records, grades earned, or program participation) and allows for aggregate report generation for use by teachers, counselors, and administrators. This use case will focus on an ILP system with this level of functionality.

Questions to Consider

Student

- What are my education and career goals?
- Am I on track to meet my education and career goals?
- Are any adjustments to my plan needed based on my progress to date?
- Which courses should I take next year?

Teacher

- Are my students missing or failing to learn critical knowledge and skills needed to be college and career ready?
- How can I make my lessons or programs most relevant to my students based on their long-term goals and interests?

Counselor

- Which of my students are falling off track and how can I help them get back on track?
- Which of my students are well on track and ready and able to advance and/or expand their preparations?
- What types of postsecondary educational opportunities exist for my students, given their specific goals?
- What types of credentials (such as industry-recognized certifications) could my students qualify for based on their high school preparation?
- What types of resources, information, or tools could I use to expose my students to different career areas that match their interests?

School and LEA Administrators

- Where are my students falling off track and how effective are my school's/district's efforts to help them get back on track?
- What kind of professional development do my teachers and counselors need to better serve the CCR needs of our students?
- To what extent do our course and program offerings meet the needs of our students based on their anticipated education needs? What types of courses or programs could be added to meet the goals of our students (online courses, dual credit courses, etc.)?
- Could we help students meet their career goals by offering industry-recognized certification exams directly to students (if we are not already doing so)?
- Is my school or district on track for meeting its college and career readiness goals?

SEA Administrators

- What are the trends in student interests, related requirements, and other key metrics?
- How are student interests aligned to state economic development goals and priorities?

Postsecondary Administrators

- How many students are planning to enter specific programs of study at postsecondary institutions within the next five years?
- Are there specific programs of study or specific geographic regions that require stronger recruitment efforts?
- What percentage of incoming students are likely to need remediation prior to taking credit-bearing postsecondary courses, based on their courses taken, grades earned, or standardized test scores?

Workforce Administrators

- In which fields are students planning to pursue employment within the next 5 to 10 years?
- Do student goals align with local workforce needs? If not, which fields of employment need stronger recruiting efforts among students?

Key Data Needs

The K12 student-level data listed below are examples of data that might be used in an online ILP to assist students with planning their coursework, high school activities, and fulfillment of requirements for entry into college or acceptance into an apprenticeship or industry training program:

- identification data, including name and student identifier (needed for populating the ILP with data from student information systems)
- cohort graduation year
- ILP information, including the date the plan was created or updated and the student's postsecondary education and career goals as expressed in a personal goal statement
- participation in career-focused programs, such as CTE and Junior Reserve Officers' Training Corps (JROTC)
- participation in accelerated learning programs, such as AP, dual enrollment, IB, and honors
- coursetaking, course grades, and credit accumulation
- grade point average
- performance on state assessments
- performance on formative assessments or diagnostic tests
- performance on specialized tests, such as assessments of social or emotional aptitude, consumer skills, financial literacy skills, etc.
- attendance

- participation in volunteer activities, internships, and/or part-time or summer employment
- postsecondary credits earned in high school through dual enrollment courses
- performance on college entrance exams, such as the SAT or ACT
- performance on industry-recognized certification exams
- information on whether a Free Application for Federal Student Aid (FAFSA) was completed
- information on postsecondary applications completed, including the names of the institutions or apprenticeship programs to which the student applied as well as the student's chosen major or career field

Additional student-level data may be useful to include in online ILPs so that schools, LEAs, or SEAs can conduct aggregate analyses of student needs. These data include

- demographic data, including race/ethnicity, sex, socioeconomic status, migrant status, limited English proficiency (LEP) status, etc.;
- school enrollment data, including LEA and school identifiers, as well as entry and exit dates;
- participation in basic programs, such as English language learners, gifted and talented, special education, etc.;
- participation in CCR support program or intervention services, such as tutoring, mentoring, wraparound family services, dropout prevention programs, etc.; and
- date and type of high school credentials earned, including diploma and industry credential.

Useful Analytics

Students

For students (and their parents) to track their progress, an online ILP might include targets and actuals for

- attendance rate;
- coursetaking (including course subjects and levels, and accelerated coursework);
- grade point average;
- assessment outcomes;
- fulfillment of diploma requirements; and
- fulfillment of college entry requirements.

The targets would ideally be based on the performance of past students with similar goals who were successful in meeting those goals.

Teachers

Teachers need analytic tools and reports that allow them to easily see how well their students are staying on track to meet their goals, as well as aggregate information about students in relation to goal attainment.

Administrators

Administrators need reports from student ILPs aggregated by personal goal areas to determine

- how many students are on track to meet their personal CCR goals; and
- what additional resources may be needed to support students based on student patterns in selecting particular careers or education programs as personal goals.

Helpful Feedback and Evaluation

To effectively evaluate the impact of the use of online ILPs to support college and career readiness, the following types of user feedback and comparison data can be helpful to SEAs and LEAs:

- Students, parents, teachers, and counselors can offer valuable feedback regarding the ease of use of the ILP, the accuracy of the information provided as part of the ILP (such as information available in a linked career or college exploration site, data populated into an ILP from a student information system, or analytics automatically calculated to measure a student's progress in reaching targets), and the overall usefulness of the ILP in keeping the student on course.
- Administrators at the school, district, and state level can benefit from comparative outcomes data for students who use an online ILP and students who do not use an online ILP. An impact analysis of students with ILPs can be performed at the state level by calculating the percentage difference in the individual goal completion rates of students with online ILPs as compared to students without online ILPs. The impact can also be measured by comparing baseline data for CCR outcomes prior to school-wide use of ILPs to student CCR outcomes longitudinally after all ninth-graders begin to use an online ILP.

Emerging Needs

- States and districts without online ILPs or career exploration tools for all students can investigate opportunities for offering these tools as part of their CCR initiatives.
- Ongoing use by students and their parents is critical to the success of ILPs. Thus, ease of use and effective user support are important factors in providing ILPs.
- For maximum data quality and to facilitate use, online ILPs would be connected to student information systems to receive regular data uploads.
- Predictive analytics that identify the specific target achievements students need in order to reach their personal goals can enhance the usefulness of ILPs for students, parents, counselors, and administrators.
- The inclusion of soft skills data in ILPs can be useful in highlighting the disposition characteristics needed for college and career readiness. Sources for these data can be survey tools and observation data from teachers, counselors, coaches, and other educators who work closely with students. It should be noted that these data are typically collected and used locally, and not stored in statewide longitudinal data systems.

Kentucky's ILP tool offers an example of a statewide system that is integrated into a proprietary career guidance system. The career guidance system includes an interest assessment to help students understand how their interests and career choices are related by matching student likes and dislikes to occupations included in the program. It provides information on various aspects of each occupation, including working conditions, earnings, sample career paths, and links to college programs that prepare students for the occupation. The system provides detailed school profiles for thousands of two- and four-year colleges and career and technical schools in the country. The ILP tool helps students store and organize information about career development activities and experiences (this portion of the ILP tool is shared with a resume builder tool). ILP data, including demographic, program, and assessment data, are pulled weekly from Kentucky's statewide student information system. Course-level detail data are not currently pulled from the student information system.

Nebraska provides Nebraska Career Connections, a free 24-7 online resource available to students, parents, adult job seekers, and schools, supported through a partnership with the Department of Labor, Vocational Rehabilitation, the Department of Corrections, and other business and industry partners. The online resource allows students to explore college and career opportunities, develop a personal learning plan, and identify interests in a variety of career areas around the 16 Career Clusters in the National Career Clusters® Framework. School districts can run reports from the system that include

- individual student and aggregate data on results of assessments including career interests, skills, and work values;
 - individual student and aggregate data on usage/completion of the career development process (i.e., resumes, e-portfolio);
 - electronic personal learning plans management; and
 - individual and aggregate data on the postsecondary schools, scholarships, and occupations that students are considering.
-

In 2012 **New Jersey** conducted a pilot program with several districts to offer online Personalized Student Learning Plans (PSLPs) to high school students. Some high schools that participated in the pilot continue to provide PSLPs for their students, although the SEA does not require their use. Each school varies in the extent to which the PSLP tools are populated with data from the student information systems. Various aggregated reports can be generated from the PSLP tools. These include reports on the numbers of students who have completed PSLPs, or reports on where students have applied to college. Some PSLP tools can be used to conduct student surveys on CCR topics and generate reports from those surveys. Students in all districts can use the SEA-hosted New Jersey Career Assistance Navigator website, which provides online tools for students to explore careers and create career portfolios.

Use Case #2: Educator Support Systems to Address Student-Specific Needs

Educator support systems provide information and tools that teachers, counselors, principals, administrators, and educator preparation programs need to prepare all students to be college and career ready. These systems support educators in developing pedagogical skills and knowledge as well as identifying which students need additional support in meeting their education goals, or which students may be ready for more challenging coursework. Educator support systems may include early warning systems and assessment systems that provide diagnostic reports, coupled with an online professional development resource system for educators.

Early warning systems are data-based tools that use specific indicators to identify students who may not be on track to meet their education goals, including students who are at risk of dropping out of school. These indicators typically include attendance, discipline incidents, grade point average, and coursetaking.

Assessment systems providing **diagnostic reports** highlight areas of individual- and aggregate-level student strengths and weaknesses on the tested material. Student-level data identify which students need additional instruction in order to learn the material and successfully advance to the next level. Aggregate-level data on the percentage of students failing specific test items can guide teachers in modifying their instructional approaches and seeking targeted professional development.

Online professional development resource systems allow teachers to conveniently obtain timely and on-demand assistance to expand and refine their instructional repertoire to address their students' needs. Administrators and teacher preparation programs can use these systems to provide CCR-targeted courses to teachers, monitor the delivery of the coursework, and collect feedback data about the effectiveness of the professional development offerings.

Questions to Consider

Teachers

Early Warning System:

- Which students are struggling with academic content and are not on track to be successful in grade-appropriate work?

Diagnostic Reports:

- In which specific content areas do my students need additional instruction?
- Which students are ready for more advanced work?
- In which specific content areas do I need support with my instructional strategies and content knowledge?

Counselors

Early Warning System:

- Which students are at risk of dropping out or not graduating on time?

Diagnostic Reports:

- Which students need targeted support for overall academic success?
- Which students need remedial instruction in math or English language arts?

K12 School Administrators

Early Warning System:

- How well is our school supporting all students to achieve the academic success needed for college and career readiness?
- Are there patterns of increased absence rates for particular courses or periods?
- What types of intervention programs should we offer to support our students?

Diagnostic Reports:

- Where do our teachers need professional development to improve instructional practices?
- Which teachers show the most success with instructing at-risk students?

LEA Administrators

Early Warning System:

- Which of our schools have the highest rates of students on track for graduation?
- What types of intervention programs and resources are needed at schools in our district?

Diagnostic Reports:

- How effective are our schools in supporting students to achieve the academic success needed for college and career readiness?

SEA Administrators

Early Warning System:

- Which LEAs have the highest rates of students on track for graduation?

Diagnostic Reports:

- How effective are our LEAs in supporting students to achieve the academic success needed for college and career readiness?

Postsecondary Teacher Preparation Program Staff

Diagnostic Reports:

- How effective are our graduates in supporting students to achieve the academic success needed for college and career readiness?
- What areas of pedagogy or content could be strengthened in our programs to assist our teacher candidates?
- What needs are evident statewide that could be integrated into pre-service coursework?

Key Data Needs

Early Warning Systems:

Student Data

- identification data, including name and student identifier
- demographic data, including age, race/ethnicity, sex, socioeconomic status, migrant status, LEP status, etc.
- cohort graduation year
- mobility (the number of times a student changes schools)
- school enrollment data, including LEA and school identifiers, as well as entry and exit dates
- participation in basic programs, such as English language learners, gifted and talented, special education, etc.
- participation in CCR support programs or intervention services, such as tutoring, mentoring, wraparound family services, dropout prevention programs, etc.
- participation in accelerated learning programs, such as AP, dual enrollment, IB, honors, etc.
- attendance
- discipline (suspensions or expulsions)
- retention (whether or not a student has been retained in a grade)
- coursetaking, course grades, and credit accumulation
- additional course information for a teacher-student link: common course code, section, year taken, and teacher of record
- grade point average
- performance on state assessments
- performance on formative assessments or diagnostic tests

Diagnostic Reports:

Student Data

- identification data, including name and student identifier
- demographic data, including race/ethnicity, sex, socioeconomic status, migrant status, LEP status, etc.
- school enrollment data, including LEA and school identifiers, as well as entry and exit dates
- coursetaking, course grades, and credit accumulation
- additional course information for a teacher-student link: common course code, section, year taken, and teacher of record
- scores on diagnostic assessments
- additional information related to the specific assessment instrument, including individual student item responses on diagnostic assessments, item and distractor analyses, standard and performance indicator analyses, and assessment to standard mapping

K12 Staff Data

- staff identifier
- teacher preparation program data (i.e., which teacher prep programs did teachers attend)

Useful Analytics

Indicators frequently used in early warning systems to identify at-risk students include:

Student Data

- attendance rates, including daily attendance and course attendance, as measured against chronic absenteeism thresholds
- the number and frequency of discipline incidents
- over-age indicator (is the student older than the average age for his or her grade?)
- retention indicator (may be different from over-age indicator)
- performance on state assessments and college entrance exams as compared to a specific target
- grade point average
- percentage of total needed credits earned to date
- interventions or supports received
- courses completed toward meeting diploma requirements or courses needed/pending, used to help measure whether the student is on track to graduate
- number of courses with grades = F

School and LEA Data

- aggregate student attendance rates by subgroups
- number and percentage of discipline incidents by student subgroup
- percentage of over-age students by student subgroup
- percentage of students scoring proficient on state assessments, by student subgroup
- average grade point average by student subgroup
- percentage of students on track to earn 100 percent of needed credits by cohort graduation date
- course attendance rates

Indicators for diagnostic assessment reporting systems include:

Class, LEA, and SEA Data

- percentage of students, by subgroup and by class/teacher, scoring below 'average' or 'proficient' level on specific items mapped to state standards

Helpful Feedback and Evaluation

Early Warning Systems

Perhaps the most important evaluation needed for early warning systems is determining whether the analytic model is appropriately predicting the at-risk students. To do this, early warning systems may need to pull data from other sources. For example, if a student is assigned a dropout status in a student information system, automated checks could be in place to determine whether that student had been flagged in an early warning system.

Diagnostic Assessment Systems

Similar to early warning systems, the most important evaluation needed for diagnostic assessment systems is whether they accurately diagnose the areas for which individual students need support. In addition, user feedback can help determine whether the level of detail in the diagnostic reports is sufficiently actionable for the teachers.

Emerging Needs

- Continuing to increase the amount of pre-high school data available in early warning systems, such as adding attendance levels and test results from elementary and middle school, will allow for earlier identification of students needing augmentation or intervention services.
- Incorporating additional CCR-related items into an existing early warning system can help transform a dropout prevention system into a CCR success system. These indicators might include presence of an ILP, preparation in a CTE Career Pathway program, or AP coursetaking or dual enrollment. Early warning systems might also be linked to an ILP system to allow counselors to be alerted when a student's grade point average is falling below the threshold needed for entrance into the student's college of choice.
- Implementing learning management systems that seamlessly link content, assessments, learning resources, and professional development resources can improve instruction and educational outcomes for all students.

Diagnostic assessment systems and related tools are widely used, but few are systematically integrated into a cohesive system. As an example of a diagnostic assessment system currently in place, **Yonkers (NY) Public Schools** produces reports for schools based on student performance on state assessments. The items on the assessments are linked to state standards, and the diagnostic reports flag the content standards for which the students have not yet achieved proficiency.

Developed in 2010, **Maine's** early warning system evaluates ninth-graders for dropout risk factors using research-based indicators. The At-Risk Data Mart, which is a module in the statewide longitudinal data system's data warehouse, is an online tool that allows educators to create, assign, and manage programs and interventions for at-risk students. Maine is working with researchers to leverage the At-Risk Data Mart to help identify high school students at risk of needing remedial courses when they enter college. The goal is to identify those students before 12th grade so that necessary remediation can be provided before the students complete high school.

Oklahoma released the initial version of its early warning system in 2012. The system is intended to identify students at risk of not graduating on time, and will eventually include the following student-level data:

- demographic information (name, age, student testing number, gender, English language learner indicator, Title I indicator, special education eligibility indicator, special education disability code)
- grade level (a student whose age is two years greater than normal for the current grade level may be indicated as at-risk)
- district/school the student currently attends
- scheduled graduation year (based on initial enrollment in public education or the student's Individualized Education Program)
- attendance (the number of absences for the specified timeframe)
- grades in core courses (the number of D and F grades received by the student in math and reading during the specified timeframe)
- grades in other courses (the number of D and F grades received by the student in non-core courses during the specified timeframe)
- number of credits (the number of credits the student has completed since 7th grade)
- discipline (the number of in-school and out-of-school suspensions for the specified timeframe)
- mobility (the number of times a student has changed schools during the specified timeframe)
- assessment (the number of state assessments on which the student has scored lower than proficient)
- intervention notes (notes created by the teacher, counselor, or principal indicating interventions used to assist the at-risk student)

Use Case #3: Postsecondary Feedback Loops to Guide CCR Programmatic Decisions

SEAs and LEAs are developing and implementing CCR academic standards, aligned assessments, and support programs to improve the readiness of high school graduates for college and career. Timely data are needed to measure the effectiveness of these efforts in improving student college and career readiness. One of the most commonly used outcome measures for determining the effectiveness of a comprehensive CCR program is the percentage of high school graduates who enroll in a postsecondary education program within a designated time interval, and thereafter successfully complete credit-bearing, non-remedial coursework. Another possible outcome measure is the percentage of high school graduates who secure employment in the field of their choice after successfully completing postsecondary degree programs or workforce training programs. Measuring progress on these outcome goals requires data from postsecondary and workforce agencies. This use case will focus on evaluating CCR programs with the use of postsecondary education data used in postsecondary feedback loops.

A postsecondary feedback loop is the process in which postsecondary institutions share timely information with K12 education agencies regarding the enrollment and academic achievement of high school graduates enrolled at their institutions. This information has traditionally been provided in the form of high school feedback reports. However, states are now beginning to build sophisticated web portals that provide summary reports available to the public as well as web tools with secure access that allow certified users from schools, LEAs, and SEAs to access information on graduates from specific high schools. Some states without web-based postsecondary feedback loops continue to manually distribute high school feedback reports to designated school and LEA recipients using secure file transfer protocols.

Questions to Consider

School Administrators

- Which courses/courses of study in my high school best help my students achieve their postsecondary goals? Which courses/courses of study in my high school need more rigorous instruction or better alignment with postsecondary expectations?
- How effective are the CCR support programs available in my high school and for which student populations are they most effective? What additional support programs are needed?

LEA Administrators

- How well do our high schools prepare students for college and career success? Do our graduates require remediation when they enroll in college?
- Are our high schools delivering effective CCR instruction and support programs? Which high schools are most effective in delivering CCR instruction and support programs? Do our schools have the support and resources they need to improve the college and career readiness of their students?

- What disparities exist among various student subgroups in attaining postsecondary success, and what additional services are needed to target these subgroups? Do these patterns vary by school?
- Do students' grades in our core high school courses predict success in postsecondary courses in the same subjects?
- Does there appear to be a consistent grading policy across high schools in core academic classes? Do the grades/marks align with proficiency on national, state, and local assessments?
- At which colleges do our graduates enroll? At which colleges are our graduates most successful?

SEA Administrators

- How well are the state CCR standards ensuring sufficient academic preparation for college? How can improved implementation of the standards and better technical assistance/support from the SEA to districts improve college and career readiness?
- Where is more discussion needed with the postsecondary sector in aligning high school coursework with postsecondary coursework?

Postsecondary Administrators

- Are there college-ready students who are not applying to or attending college?
- How well do high school coursetaking patterns and participation in certain programs predict college enrollment and completion? How well do grade point average and assessment performance predict success? How do these indicators and patterns vary by district and over time?
- How well does participation in high school CTE programs predict success on industry-recognized certification exams?
- Where is more discussion needed with the K12 sector in aligning high school coursework with postsecondary coursework?

Key Data Needs

Student-level data from both K12 and postsecondary education agencies are needed to measure the success of an SEA's or LEA's CCR programs with a postsecondary feedback loop. These data include the following:

K12 Student Data

- identification data, including name and student identifier
- demographic data, including race/ethnicity, sex, socioeconomic status, migrant status, etc.
- cohort graduation year
- school enrollment data, including LEA and school identifiers, as well as entry and exit dates
- participation in basic programs, such as English language learners, gifted and talented, special education, etc.

- participation in accelerated learning programs, such as AP, dual enrollment, IB, honors, etc.
- coursetaking, course grades, and credit accumulation
- additional course information for a teacher-student link: common course code, section, year taken, and teacher of record
- performance on state assessments
- postsecondary credits earned through dual enrollment
- performance on college entrance exams, such as the SAT or ACT
- high school credentials earned, including diplomas and industry credentials

Postsecondary Student Data

- identification data, including name and identifier
- enrollment in postsecondary institution, including postsecondary identifier and entry and exit dates
- coursetaking and course grades, including enrollment in remedial, non-credit-bearing courses
- credits earned
- credentials earned (degree, certificate, industry recognized certification, and/or occupational license)

Useful Analytics

In order to measure growth in program effectiveness, baseline data are needed for the year prior to when a program is implemented. Analytic tools should be able to combine the student K12 information with the postsecondary information, and percentages should be calculated to facilitate tracking of improved outcomes over time. These indicators need to be reported for various student subgroups to identify potential inequities in how well students are prepared for college and career. Examples of indicators include

- the percentage of high school graduates who enroll in a postsecondary institution within 6 months of high school graduation;
- the percentage of high school graduates who enroll in a postsecondary institution within 16 months of high school graduation (required for certain federal grant reporting);
- the percentage of high school graduates who earn 1 year of college credit within 2 years of high school graduation (required for certain federal grant reporting);
- the percentage of high school graduates who take remedial postsecondary courses;
- the percentage of high school graduates who complete a postsecondary certificate or degree program, and
- the percentage of high school graduates who earn an industry-recognized certification or occupational license.

One barrier to using these indicators effectively is the inability of many SEAs to easily access postsecondary outcome data for their high school students from private or out-


of-state institutions of higher education. Some states have chosen to form consortia with neighboring states to share data; others subscribe to the services of the National Student Clearinghouse to obtain data on their high school graduates who attend institutions that participate in the Clearinghouse.

Helpful Feedback and Evaluation

User input from schools is needed regarding the timeliness and completeness of the data available through the postsecondary feedback loops. Specifically, schools should provide estimates of the percentages of their former students for whom postsecondary results are included in the reports.

Emerging Needs

- Currently, postsecondary feedback loops or high school feedback reports may only contain snapshot data for one year of outcomes for a particular high school cohort. Additional years of data—i.e., for each year up to 6 years out from high school graduation—would provide a more complete picture of outcomes for high school graduates.
- The number and types of postsecondary credentials and postsecondary education providers are expanding, making it more challenging for SEAs and LEAs to collect accurate postsecondary attainment outcomes on all students.
- The number and types of workforce credentials are expanding, including industry-recognized certifications, state occupational licenses, non-credit certificates, and badges. While many of these credentials have labor market value, the proliferation of these credentials and the wide variety of organizations that award them (states, industry associations, companies) make it challenging to include them in data systems.
- To best support students, parents, teachers, counselors, and local administrators, indicators need to be evaluated for their predictive potential. It is not enough to measure for program evaluation; stakeholders need to know what the indicators mean and how they contribute to the overall picture of readiness. Aligned longitudinal data across K12 and postsecondary institutions allows for predictive analytics. Students will benefit from understanding the specific achievement targets needed for their ultimate success in college and career based on outcomes data for students who graduated before them. K12 agencies will benefit from understanding the approaches that work best in preparing students for high school graduation and postsecondary education or workforce training, and postsecondary institutions will benefit from understanding the K12 student indicators that contribute to ultimate success in college.
- Continued efforts are needed to overcome existing barriers in sharing data among SEAs and private or out-of-state institutions of higher education. For example, in 2014 the Western Interstate Commission for Higher Education conducted a pilot project to facilitate a data exchange among four western states: Washington, Oregon, Idaho, and Hawaii. The states shared data on postsecondary enrollment and workforce participation, allowing for more complete analyses of



postsecondary and workforce outcomes for high school graduates in those states. The pilot demonstrated that a multistate longitudinal data exchange that protects student privacy is possible. In addition to plugging significant gaps in each state's data that result from student and worker migrations, the pilot also demonstrated how cooperative cross-state data sharing can help address workforce planning.⁵

- Although remedial coursework in college is generally defined as courses taken at a postsecondary institution for which no credit is earned upon successful completion, no official definition currently exists, and not all postsecondary institutions are consistent in how they report students needing remedial coursework. A common definition developed and adopted by all postsecondary institutions would be helpful.

⁵For more information on the processes and lessons learned from the pilot, see the 2014 summary report available at <http://wiche.edu/pub/building-capacity-tracking-human-capital-development-and-its-mobility-across-state-lines>.

Oklahoma is working on a postsecondary feedback loop that will include predictive analytics. Oklahoma's K20 Center, in cooperation with the Oklahoma State Regents for Higher Education, is developing a CCR dashboard that will allow students, parents, and schools to explore how current student performance on selected benchmarks (e.g., ACT, GPA, attendance, End of Instruction Exams) correlates to likelihood of success in their first year—and beyond—in an institution of higher education within the state of Oklahoma. A data model is in development that will allow statistically valid comparisons of a student's current performance against predicted performance in higher education.

The **Montana** Office of Public Instruction (OPI) released its Growth and Enhancement of Montana Students (GEMS) website in 2014. The website provides secure access to multiple years of data and interactive reports on student achievement, high school graduation rates, enrollment, program and course offerings, district and school profiles, and other data tools, including reports on college readiness. The Montana High School Follow-up Reports provide enrollment, remediation, and retention statistics for graduates of Montana public and state-funded high schools who are entering the Montana University System. These reports begin with the high school graduating class of 2011 and summarize the statistics for all public and state-funded high school graduates in the state of Montana for a given school year. The website also includes the National Student Clearinghouse StudentTracker reports by school for information on students who attend out-of-state or private institutions that participate in the National Student Clearinghouse.

In order to produce the Montana High School Follow-Up Reports, the Montana Office of Postsecondary Instruction sends an enrollment file to OPI a few months after the beginning of the academic year in the fall. The data file includes information on all Montana high school graduates including enrollment status, remediation needed, retention (students who earned 1 year of credit within 2 years of high school graduation), and students who enrolled within 16 months of graduating from high school. OPI cleans the file; matches the students by name, birthdate, and graduating high school of record to the data in the OPI data system; produces reports; and posts the reports on GEMS. The interactive reports are available at the state, county, district, and school levels. Users can run reports for a selected school year or postsecondary enrollment period according to the following student subgroups: all, race/ethnicity, socioeconomic status, gender, special education, English language learner, and by county, school, or district. The non-public secure site contains additional information for each school.

Montana plans to eventually include ACT data in the college readiness reports, as well as coursetaking patterns in high school compared with courses and grades earned in public postsecondary institutions. The state is also working on a direct transcript solution.

Use Case #4: Metrics, Accountability, and Continuous Improvement

It is important that CCR standards, assessments, and instructional support programs developed by SEAs and LEAs provide a firm foundation for continuously improving student outcomes as well as satisfy legislated accountability requirements. Resources can be used most efficiently when measures used for accountability reporting are also useful for monitoring students' college and career readiness. Increasingly, education agencies are incorporating CCR indicators in their accountability systems and reporting. This use case looks at the CCR indicators that are commonly included in agency and school report cards.

Questions to Consider

Parents/General Public

- Which high schools do the best job in preparing their students to be college and career ready?

LEA Administrators

- Do our schools meet state accountability and continuous improvement requirements for our CCR goals?
- Which schools need interventions or supports? Which schools can be used as models?
- Does our district meet state accountability and continuous improvement requirements?
- What metrics can support the continuous school improvement process?

SEA Administrators

- Is our state on track to meet accountability and continuous improvement requirements for our CCR goals?
- Which district administrators would benefit from professional development on continuous improvement practices?
- Which LEAs can serve as models for others?
- How effective are our state CCR programs?

SEA Policymakers

- Where is assistance needed to support cooperation among the K12, postsecondary, and workforce sectors to promote CCR goals?
- Is our base funding to districts adequate, or is additional funding needed to support CCR programs and initiatives?
- How well are state support functions, programs, and practices working to effectively support district design and implementation needs?

Key Data Needs

The data needed to support continuous improvement and accountability reporting are much the same as those needed for program evaluation. The specific data needed will

depend on a state's or district's specific CCR goals and approved metrics. Generally, these data include the following:

K12 Student Data

- demographic data, including race/ethnicity, sex, socioeconomic status, migrant status, LEP status, etc.
- cohort graduation year
- school enrollment data, including LEA and school identifiers, as well as entry and exit dates
- participation in basic programs, such as English language learners, gifted and talented, special education, etc.
- participation in CCR support programs or intervention services, such as tutoring, mentoring, wraparound family services, dropout prevention programs, etc.
- participation in accelerated learning programs, such as AP, dual enrollment, IB, honors, etc.
- attendance
- performance on state assessments
- performance on college entrance exams, such as the SAT or ACT
- high school credentials earned, including diploma and industry credentials

Postsecondary Student Data

- identification data, including name and identifier
- enrollment in postsecondary institution, including postsecondary identifier and entry and exit dates
- coursetaking and course grades, including enrollment in remedial, non-credit-bearing courses
- credits earned
- degree or certificate earned
- industry-recognized certifications or occupational licenses earned

Workforce Employee Data

- employee identification
- employment status
- industry in which employed
- military enlistment after graduation
- earnings

The **Education Commission of the States** found that as of June 2014, there were 27 states reporting specifically on college and career readiness (13 states) or on proxies for readiness (14 states). The following indicators of postsecondary and career readiness were commonly used by states: dual enrollment participation and/or completion; Advanced Placement participation and/or results; ACT/SAT participation and/or results; International Baccalaureate program participation; college-going rate; percentage of students taking algebra in grade 8; industry certifications earned; percentage of students enrolled in postsecondary programs; and percentage of students assessed as needing college remediation (ECS 2014a).

Useful Analytics

Continuous improvement measurements, like program evaluation measurements, require multiple years of data. Analytic tools are useful when they can combine students' K12 information with the postsecondary and workforce information. It is also helpful to calculate percentages to reflect the degree of change that occurs over time to facilitate tracking of improved outcomes. SEAs and LEAs commonly use the following CCR indicators:

- the percentage of high school students enrolled in accelerated learning programs
- the percentage of students who score at the college-ready level on a high school assessment anchored to CCR standards
- the percentage of students performing at CCR-ready levels on state exit exams
- the percentage of students graduating with a high-level CCR-designated diploma
- the percentage of high school students earning an industry-recognized certification in addition to a high school diploma
- the percentage of high school graduates entering the military within 1 year of high school graduation, or enrolled in ROTC in college
- the percentage of high school graduates who enroll in college within 6 months of high school graduation
- the percentage of high school graduates who enroll in college within 16 months of high school graduation (required for certain federal grant reporting)
- the percentage of high school graduates who earn a year of college credit (as defined by the state) within 2 years of high school graduation (required for certain federal grant reporting)
- the percentage of high school graduates enrolled in college who are required to take remedial courses
- the percentage of high school graduates who complete a postsecondary certificate or degree program

Helpful Feedback and Evaluation

Users may provide feedback on how easily the indicators can be understood and the accessibility of the reports. Policymakers and administrators may also want to evaluate how well the reports are being used to support continuous improvement efforts, rather than simply meeting reporting requirements.

Emerging Needs

- The inclusion of workforce outcomes in CCR accountability metrics will require better connections between education and workforce data.

Hawaii produces a College and Career Readiness Indicators (CCRI) report for each high school in addition to the state accountability report. The CCRI report includes the following metrics:

High School Outcomes

- high school completers by diploma type (Board of Education recognition, regular, or certificates of completion)
- on-time graduation rate
- Hawaii state assessments, including the percentage of students proficient in reading, math, and science
- Advanced Placement (AP), including the number and percentage of completers taking AP exams along with the number and percentage of those scoring 3 out of 5 or better on at least one exam, the average number of exams taken per student, and the number and percent of exams scored 3 or better
- Running Start (dual enrollment) participants
- College Board SAT (average scores) plus the number and percentage of students taking the SATs in Critical Reading, Mathematics, and Writing

College Enrollment

- college enrollment nationwide, fall at two-year and four-year institutions, and the percentage of completers (out-of-state enrollment data are obtained from the National Student Clearinghouse)
- college enrollment at the University of Hawaii, fall (at two-year and four-year institutions, and the percentage of completers)

High School (Hawaii) to College (University of Hawaii System) Transition

- mathematics, including the number and percentage enrolled in mathematics courses at the University of Hawaii at the college level, remedial or developmental level, “other” level, or not enrolled in any mathematics course
- English, including the number and percentage enrolled in English courses at the University of Hawaii at the college level, remedial or developmental level, “other” level, or not enrolled in any English course

Examples of States Incorporating CCR Measures into Federal Accountability

Indiana gives each school a grade (A-F) based on an index that includes student achievement and growth and, for high schools, graduation rate and college and career readiness. The college readiness component is based on participation in AP and IB exams, dual credits, and industry certifications.

Georgia established a holistic rating system for schools called the College and Career Ready Performance Index (CCRPI). The index is used as an accountability tool for school improvement. Multiple indicators of student performance, progress, and achievement gap closure are used in the CCRPI. Performance targets for English/language arts, reading, mathematics, science, and social studies in grades 3-8 and high school assessments—including ninth-grade literature, American literature, economics, mathematics, physical science, biology, and U.S. history—require schools and districts to cut the number of students not proficient in half within 6 years for all students and disaggregated student subgroups. In addition, the state established performance targets for the on-time adjusted cohort graduation rate. Other indicators in the CCRPI include attendance, measures of college and career readiness such as ACT and SAT performance, and the percentage of grade 8 students passing at least four courses in core content areas.

Use Case #5: Maximizing Career Opportunities for All Students

One of the goals of K12 education is to prepare students for successful careers aligned both with individual student interests and anticipated workforce needs. To do so, the education sector needs ongoing communications with the workforce sector. Education agencies need current and projected labor market information from workforce agencies, including information on anticipated high-demand careers and the education qualifications needed for success in those careers.

The level of education needed for a student to be career ready will depend on his or her specific career goals. Not all careers require a four-year postsecondary degree; many anticipated job openings in the next 5 years will require a sub-baccalaureate certificate, industry certification, or associate's degree. For careers that require 4 years or more of postsecondary education, some would argue that a K12 institution's accountability for a student effectively ends when the student graduates from high school and is capable of successfully completing postsecondary credit-bearing courses. For careers that require less than a four-year postsecondary degree, K12 CTE programs provide important preparation for employment and workforce training.

Policymakers are recognizing the vital role that CTE plays in preparing students to be college and career ready, and many state legislatures have established formal mechanisms to solicit business perspectives to inform local CTE programs of study (ECS 2014a). The involvement of potential employers in planning CTE programs of study can help ensure that students are learning the skills and knowledge that employers need.

Some CTE programs of study require only high school coursework, with an industry certification awarded upon successful completion. Most CTE programs of study, however, require additional postsecondary training to build on the technical training acquired in high school. Thus, cooperation between K12 and postsecondary agencies is needed to provide students with a well-defined sequence of coursework needed to complete a specific career pathway. In addition, since most CTE programs of study span high school and postsecondary education, CTE classes in high school should be of sufficient academic rigor to prepare students for the postsecondary education they need to earn a credential in their chosen careers. This use case focuses on key data and analytics needed to determine whether K12 CTE programs of study are preparing students for both postsecondary and workplace success.

Questions to Consider

School Administrators

- Which CTE courses in my high school need more rigorous instruction?
- Which teachers need professional development to improve instructional practices?

LEA Administrators

- How effective are our CTE programs in preparing students for continued postsecondary education and eventual employment in specific fields?
- Which courses/courses of study need more rigorous instruction or better alignment with postsecondary expectations?
- Which CTE programs of study are needed within specific schools or districts based on the ILPs of students in those schools and districts?
- How many of our students are finding employment related to their programs of study?
- Which schools are experiencing the best results in preparing students to graduate on time with an industry-recognized certification?
- Which schools need support to improve the quality of their CTE programs?

SEA Administrators

- How effective are our CTE programs?
- Which programs of study are needed within specific districts based on the ILPs of students in those schools and districts?
- Which districts are experiencing the best results in preparing students to graduate on time with an industry-recognized certification?
- Which districts need support to improve the quality of their CTE programs?

Key Data Needs

Student-level data from the K12, postsecondary, and workforce sectors are needed to measure the success of CTE programs, including the following:

K12 Student Data

- identification data, including name and student identifier
- demographic data, including race/ethnicity, sex, socioeconomic status, migrant status, LEP status, etc.
- cohort graduation year
- school enrollment data, including LEA and school identifiers, as well as entry and exit dates
- participation in basic programs, such as English language learners, gifted and talented, special education, etc.
- participation in career-focused programs, such as CTE or JROTC
- participation in CCR support programs or intervention services, such as tutoring, mentoring, wraparound family services, dropout prevention programs, etc.
- participation in accelerated learning programs, such as AP, dual enrollment, IB, honors, etc.
- ILP information, including the date the plan was created or updated, and the student's postsecondary education and career goals as expressed in a personal goal statement
- coursetaking, course grades, and credit accumulation

- additional course information for a teacher-student link: common course code, section, year taken, and teacher of record
- participation in volunteer activities, internships, and/or part-time or summer employment
- grade point average
- performance on state assessments
- postsecondary credits earned through dual enrollment
- performance on college entrance exams, such as the SAT or ACT
- performance on exams for industry-recognized certifications
- type of high school diploma earned

Postsecondary Student Data

- identification data, including name and identifier
- enrollment in postsecondary institution, including postsecondary identifier and entry and exit dates
- coursetaking and course grades, including enrollment in remedial, non-credit-bearing courses
- credits earned
- degree or certificate earned
- industry-recognized certifications or occupational licenses earned

Workforce Data

- employee identification data
- employment status
- industry in which employed
- military enlistment
- earnings

Matching Education and Workforce Data

The use of Social Security numbers as identifiers in workforce records presents a significant challenge for K12 education agencies in matching their data with workforce data because most SEAs and LEAs do not collect Social Security numbers as part of student records. Successful matching techniques require close cooperation with other agencies, and thus a strong interagency data governance structure can significantly help with these efforts. Currently, a single matching solution does not exist, and SEAs are working to identify appropriate methods for their own circumstances. Some states have developed secure and transparent connections to workforce data by partnering with postsecondary agencies, which generally use Social Security numbers in their student records, or by partnering with research and/or workforce centers.

Useful Analytics

Analytic tools are needed to combine student K12 information with student postsecondary and workforce information, and to calculate percentages to facilitate tracking of improved outcomes over time using multiple years of data. The following indicators are commonly used:

- the percentage of high school completers earning an industry credential in addition to a high school diploma, for both CTE concentrators and non-CTE concentrators
- the percentage of high school completers who enroll in postsecondary training within 16 months of high school graduation, for both CTE concentrators and non-CTE concentrators
- the percentage of high school completers who need remediation in college courses, for both CTE concentrators and non-CTE concentrators
- the percentage of high school completers who complete a postsecondary certificate or degree program
- the percentage of high school completers who enter the workforce full time within 1 year of completing a postsecondary certificate or degree program, along with their occupational field and their wages earned, for both CTE concentrators and non-CTE concentrators

Helpful Feedback and Evaluation

Users should provide feedback on the accessibility and ease of use of the reports. In addition, administrators and policymakers may want to evaluate how well the reports are used for continuous improvement efforts to strengthen CTE programs.

Emerging Needs

- SEAs and LEAs need to continue efforts to establish reliable methods for connecting education and workforce data in order to improve the quality and completeness of available data, thereby improving the accuracy of the analytics.
- Administrators and policymakers may want to share reports on CTE program effectiveness as a way to demonstrate the potential for strong CTE programs.
- To best assist students (and their parents and counselors), predictive analytics on specific targets students should achieve to succeed in particular Career Pathways could be calculated and made available to students.

Nebraska's *reVISION* program is a state-facilitated process that brings together career educators, school administrators, guidance counselors, and industry professionals to

- align and support CTE systems with Nebraska's economic initiatives;
- develop Nebraska's talent pipelines for economic growth and workforce development;
- strengthen high school CTE programs to align with Nebraska's postsecondary education entrance expectations; and
- create a common language between local employers and education agencies.

The *reVISION* process will ensure that Nebraska students leave high school with the knowledge and skills required for employment in local or regional businesses, and it will also provide opportunities for students to experience a smoother transition from high school to postsecondary education. *reVISION* plays a key part in developing a talent pipeline for economic growth and workforce development in Nebraska.

Washington State established the Education Research and Data Center (ERDC) in 2007 within the state's Office of Financial Management. The ERDC conducts analyses of early learning, K12, and higher education programs, and education and workforce issues across the P-20 system. The ERDC produces reports on high school outcomes, including percentages of high school students—by school and district—enrolling in postsecondary institutions, and percentages of those students requiring remedial math or English. In addition, ERDC will soon be releasing data on the percentage of postsecondary graduates who are employed in the state, including data on their annual wages. ERDC also plans to include workforce outcome reports for high school graduates by year, school, and district. Workforce data are limited to employers in Washington State and do not include civilian military employment. In addition to snapshot reports that show outcomes for cohorts of students as of a specific date, the ERDC expects to produce more longitudinal reports that provide outcomes over multiple years for a specific class of graduates.

High schools and school districts can access data from the ERDC website. If a school or district is interested in outcomes data for a specific group of students (e.g., a group of students that participated in a specific program) the agency can send a file with the student information, including student identifiers, and the ERDC will provide a de-identified file containing outcomes data for that group of students. The ERDC also prepares the reports for schools and districts that are required for funding under the Perkins Act (CTE programs). These reports include workforce data. Washington has a separate state-level Career and College Readiness office within the state's K12 agency that works to promote the quality and rigor of CTE and secondary education courses, provide students with options that link middle school to high school and to postsecondary opportunities, blend academic and technical studies, and connect students to their goals for the future.

In addition to providing K12 and postsecondary education agencies with data analyses, the ERDC provides data reports to state workforce agencies that include information on individuals collecting unemployment insurance. Workforce agencies are interested in knowing what kinds of educational activities these individuals were engaged in while they were unemployed—for example, which individuals were enrolled in GED, community college, or trade apprenticeship programs.

Sources for Workforce Data

The primary sources for workforce data for state and local education agencies are **local employment commissions**, which produce quarterly wage records and unemployment records. The limitations on these records are that they are only available for workers within a specific locality, and they use Social Security numbers as individual identifiers. Federal (including military) workers are not included in the local employment reports.

The **Federal Employment Data Exchange System** (FEDES) is a common data exchange environment that provides states and other federal grantees with access to federal civilian and military employment records. Quarterly data exchanges are conducted with three federal agencies: the Office of Personnel Management; the Department of Defense, Defense Manpower Data Center; and the U.S. Postal Service. The data may only be used for federal reporting purposes, and the data cannot be stored in state data systems for future analysis.

The **Wage Record Interchange System** (WRIS) facilitates the exchange of wage data among participating states for the purpose of assessing and reporting on state and local employment and training program performance, evaluating training provider performance, and for other purposes allowed under the WRIS Data Sharing Agreement. The exchange permits state workforce agencies to obtain wage data for individuals who have participated in workforce investment programs in one state, then subsequently secured employment in another. By participating in WRIS, states have a more robust picture of the effectiveness of their workforce investment programs and are able to report more comprehensive outcomes against their performance measures. As with FEDES, matched data are expected to be used for program reporting purposes only and not stored in state systems for additional analysis.

The **National Governors Association** (NGA), as part of the Initiative on America Works: Education and Training for Tomorrow's Jobs, identified a set of actions that governors can take to improve the educational attainment of their citizens and the alignment of education credentials with employer demand. The following four policy components, undertaken in an integrated approach, suggest how governors can improve and better align state education and training institution results with industry demand to provide a more talented workforce:

- Articulate and implement a strong vision connecting a state's education and training pipeline with the needs of its economy to have more Americans achieve the "new minimum" of a postsecondary degree or certificate with labor market value.
- Integrate and use education and workforce data to inform policy, track progress, and measure success.
- Support and scale industry and education partnerships to get results.
- Modify the use of resources and incentives to support the attainment of the integrated vision (NGA 2014).

Chapter 3:

Overarching Issues for the Use of College and Career Ready Data

Several overarching considerations are important for the effective use of all education data. These considerations are of particular importance when using longitudinal student-level data for college and career ready (CCR) purposes. They include methods for protecting the data, communicating with stakeholders, ensuring data quality, supporting a wide range of users, and fostering a strong P-20W (early childhood through workforce) data governance system.

Privacy, Security, and Transparency

Effective data privacy and security practices, along with proactive communications with stakeholders, are essential to the successful use of data for college and career readiness. Effective communications allow education agencies to anticipate and respond appropriately to parents and other stakeholders who may raise legitimate concerns about student privacy and how student-level data are being used. It is important that state and local education agencies (SEAs and LEAs) carefully follow all requirements of state and federal privacy laws, implement sound security measures, use the data only for the stated purposes for the data collection, and be transparent about how the data are being used and protected.

Transparency entails engaging all stakeholders through appropriate communications and making all information related to data use, data privacy, and data security publicly and easily accessible on agency websites. The U.S. Department of Education's Privacy Technical Assistance Center (PTAC) offers a useful guide entitled *Transparency Best Practices for Schools and Districts* (PTAC 2014). The guide outlines best practices for balancing transparency and privacy in education data, many of which are also applicable to SEAs. Important topics include

- how to make information about student data policies and practices easy to find on a school's or district's public webpage;
- publishing a data inventory that details what information is collected about students, and what it is used for;
- explaining to parents what, if any, personal information is shared with third parties and for what purpose(s); and
- using multi-layered communication strategies that tailor the complexity of the information to the audience.

As more state data initiatives gain traction and yield benefits for students and parents, the positive aspects of expanded data use may outweigh the potential concerns about improper usage.

Tips for Stakeholder Communications

The following guidelines for stakeholder engagement and communications are adapted with minor changes from the SLDS Best Practices Brief: *Stakeholder Communications – Tips from the States* (NCES 2011).

- Identify and reach out to a range of key stakeholders early on. For CCR purposes, stakeholders may include policymakers, the public, parents, students, teachers, counselors, and administrators in K12, postsecondary, and workforce agencies.
- Create and follow a clearly defined, carefully conceived outreach plan.
- Acknowledge differences among stakeholder groups and tailor the communication style.
- Communicate with all stakeholder groups using a variety of small group and large group forums.
- Create realistic expectations in all communications.
- Form or leverage groups to lead the outreach effort.
- Identify key individuals as ‘ambassadors’ and ‘point people.’
- View communications, in part, as a change-management activity.
- Structure meetings around very specific questions or products.
- Listen and be responsive to stakeholder input; keep any promises made.
- Implement some early wins to gain and sustain stakeholder support; communicate data usage success stories.
- Give stakeholders credit for help with system design and enhancement.
- Pay attention to the political environment.

Data Quality, Data Use, and User Support

CCR initiatives are resulting in increased data usage through new tools and interfaces designed for an expanding group of stakeholders. The quality of education data has never been more important. The basic principles of data quality apply to CCR data. Education agencies can build a culture of data quality by focusing on collecting the data that will provide the right information to answer the questions being asked; ensuring the accuracy and completeness of the data; and making critical data available to users as promptly as possible (NFES 2005). In addition, education agencies need to train data users in how to use the data properly.

In general, increased usage will promote better quality data over time, as more eyes on the data can help detect data entry errors as well as potential system issues that may be causing data errors. However, the complexity of CCR data may make it difficult to ensure good quality data initially. Examples of the complexity of CCR data include the following:

- Many states are adopting new academic standards and assessments. These changes may make it difficult to conduct valid comparisons of outcomes from year to year until accountability systems, standards, and assessments are stable.
- New indicators used for CCR accountability may need a year or two of use before data collection and verification processes produce a quality dataset.
- The increase in the types of postsecondary credentials that individuals can earn, as well as the growth in proprietary education providers, may make it difficult for agencies to accurately capture all postsecondary outcomes for their K12 students. As these outcomes are increasingly used to measure the effectiveness of

CCR programs, it is important for users to understand that incomplete data in this area may produce a limited picture of students' postsecondary attainment. Clarity is needed on the percentage of students for whom it is possible to accurately determine outcomes. For example, if an agency can only determine outcomes for students who enroll in in-state, public postsecondary institutions, the agency needs to be clear what percentage of students is captured in these data and what percentage is not.

- It is possible for students to earn multiple certificates or enroll in multiple postsecondary education or training programs, resulting in the potential for duplicate counts. Data users would benefit from knowing the extent to which agencies can control for possible duplication of counts.
- Similar limitations exist with workforce data, and these limitations need to be communicated to data users. Workforce data may be difficult to match to data on K12 students, and drawing accurate conclusions about workforce outcomes requires an understanding of the relative completeness of the available data.

On the technical side, special considerations for introducing CCR-specific tools and interactive reports include

- recognizing when students and parents are stakeholders in a specific data tool or report, such as individualized learning plans and career tools, and including them in communications and planning efforts; and
- providing and promoting a robust technical user support system for data tools intended for use by students and parents. Otherwise, students may develop an over-reliance on counselors and teacher advisors for technical support.

Common Education Data Standards

One important initiative underway to help improve education data quality is the Common Education Data Standards (CEDs), a collaborative project supported by the National Center for Education Statistics at the U.S. Department of Education. As described on the CEDs website, “[w]hile education institutions across the P-20W (early learning through postsecondary and workforce) environment use many different data standards to meet information needs, there are certain data we all need to be able to understand, compare, and exchange in an accurate, timely, and consistent manner. For these, we need a shared vocabulary for education data—that is, we need common education data standards. The Common Education Data Standards (CEDs) project is a national collaborative effort to develop voluntary, common data standards for a key set of education data elements to streamline the exchange, comparison, and understanding of data within and across P-20W institutions and sectors.” For more information, see <http://ceds.ed.gov>.

Data Governance

The effective use of data to support CCR goals and initiatives requires a high-functioning data governance structure at the state level that brings together state K12, postsecondary, and workforce agencies. These interagency data governance systems are generally referred to as P-20W data governance. P-20W data governance presents more challenges than K12 data governance, including the initial challenge of bringing together various agencies to work cooperatively on a common agenda. Additional challenges for P-20W data governance may include dealing with varying security requirements, data use policies, reporting requirements, and timelines among the participating agencies. Whether or not a data governance structure is ultimately successful depends primarily on strong leadership and executive-level buy-in across state agencies and among state, regional, and local education agencies. In many states the growing focus on college and career readiness is proving to be an impetus for bringing agencies together to cooperate on data governance.

A strong P-20W data governance system would be responsible for determining policies on data privacy, security, quality, and usage. It would be responsible for identifying stakeholders and ensuring appropriate communications and training are available for those stakeholders. An important concern for P-20W data governance activities is the inclusion of students and/or parents in selected meetings or planning activities. Although expanding the number of individuals at the table for data governance discussions may result in some inefficiencies, in states or districts offering online learning plans or e-transcripts, students (and their parents) are primary beneficiaries of these tools, and they may have useful insights to share in discussions of cross-agency data sharing.

One important activity for a P-20W data governance board is the documentation of all of the data collected for CCR uses. As mentioned in the section on data privacy, security, and transparency, PTAC recommends publishing a data inventory on all data that are collected by an agency, along with how those data are used. For CCR purposes, such a data inventory would likely cross agency lines, so the inventory report may need to include data owners as well as data users. For data users, such an inventory could also include notes on data quality issues. The Regional Educational Laboratory Northeast and Islands has produced a data catalog tool—a flexible Excel workbook with a summary report feature—that could be adapted for this use. The free, downloadable tool is available at <http://www.relnei.org/publications/data-catalogue-tool-for-ccr-indicators.html>.

Example of CCR Data Governance Roles

A sound data governance program typically includes a governing body or council, a definition and allocation of authority, a defined set of procedures, and a plan to execute those procedures. There are generally three types of committees within the P-20W data governance structure: executive leadership, data governance, and data stewards. The chair of the data governance committee ideally acts as a data coordinator, managing the work of the various committees and ensuring that all work is documented and shared with the entire governance group. The following example, taken from P-20W Data Governance Challenge: College and Career Readiness (NCES 2012b), shows how a CCR policy question would be handled under this structure.

Policy question: How do we determine the readiness of students who complete high school to enter into postsecondary education and the workforce?

Executive Leadership

- Create policy.
Example: “Every student graduating with a standard high school diploma (or its equivalent) will be college and career ready.”
- Provide direction to the Data Governance Committee.
- Allocate the required resources.

Data Governance Committee

- Define “college and career ready.”
Examples:
 - Assessment scores on SAT, ACT, or a postsecondary placement test are the basis for this determination.
 - Data are needed by subtest: Reading, Writing, and Math
 - Cut-off scores determine readiness: ACT - ___ SAT - ___ Placement Test - ___
- Determine which diplomas are considered equivalent to a standard high school diploma.
Example: GED
- Establish how long a student will be given to continue into postsecondary.
Example: “Students included in this policy must continue into postsecondary the following fall semester after graduating from high school.”
- Decide what other data are needed.
Example: Race, gender, school district, high school, institution of higher education, assessment, etc.
- Determine how the data will be displayed, reported, and accessed.
Examples:
 - Data will be displayed down to the institution and subtest levels.
 - Appropriate privacy protections will be applied.
 - Aggregate reports will be made available to the general public.
 - Detailed reports will be made available to LEAs via secure access.

Data Steward Workgroup

- Determine where SAT, ACT, and placement scores are collected and stored in a shared data system.
- Determine whether collections include all three subtests.
- Identify the source system of record for GED and standard high school diploma data.
- Identify the source system of record for postsecondary enrollment data (both from within and outside of the state).
- Identify the source system of record for student demographic data (from secondary and postsecondary education and the workforce) and determine how to reconcile differences.
- Design and produce aggregate reports for the public.
 - Meet the reporting requirements as laid out by the Data Governance Committee.
 - Get approval from the Data Governance Committee before publishing reports.
- Design and produce detailed reports for LEAs.
 - Confirm that appropriate authentication for access is implemented.
 - Get approval from the Data Governance Committee before publishing reports.

Chapter 4:

Key Points and Emerging Needs

The persistent push for a better-educated workforce has led to a K12 focus on college and career readiness for all students. To support initiatives to prepare students for college and career, improved linkages among K12, postsecondary, and workforce data systems are needed, as well as new data tools for a broad array of stakeholders involved in college and career ready (CCR) efforts. A comprehensive CCR data system and set of CCR data elements have yet to be fully defined. However, by examining how education agencies are currently using data for CCR initiatives, state and local education agencies (SEAs and LEAs) can begin to identify some of the critical components and data elements needed in their data systems to effectively support their own agencies' specific CCR programs and requirements. This chapter summarizes the key points and emerging needs identified throughout this document.

Foster individualized learning through the use of individualized learning plans.

Still in its infancy as a sophisticated data tool, the individualized learning plan (ILP), also referred to as a personalized learning plan, can range from a plan made on paper to an online tool linked to school, district, or state data systems. If used properly as a dynamic tool for career exploration, education planning, and self-reflection, it holds the potential not only to guide individual students in planning their education and measuring their progress, but also to provide predictive estimates to postsecondary institutions and workforce agencies on the numbers of students considering specific colleges and programs of study. Currently, most ILP systems in use are proprietary. In some cases, SEAs provide an online ILP system that is available to all districts. In other states, individual LEAs may implement their own ILP systems. In any case, cooperation among SEAs, LEAs, and vendor partners is needed to make optimal use of the ILP systems.

Support educators in identifying and addressing student-specific needs.

Educator support systems include early warning systems, diagnostic assessments, and online professional development resource systems. Primarily used to identify students at risk of not graduating on time, early warning systems can be expanded for additional uses related to college and career readiness. For example, they can be used to identify students who may need remedial coursework to succeed at the postsecondary level so that the necessary remediation can be provided before the students leave high school. The systems could also be linked to data from student ILPs, enabling counselors to be alerted when a

student is at risk of not meeting thresholds on key indicators such as when a student's grade point average is falling below what is needed for entrance to the student's college of choice.

Guide CCR programmatic decisions through the use of postsecondary feedback loops.

Automated postsecondary feedback loops enable postsecondary institutions to share timely information with K12 education agencies regarding the coursetaking and academic achievement of high school graduates enrolled at their institutions. Of particular concern to high schools and districts is the extent to which their graduates require remedial coursework when they enter college. These data can help schools and districts determine the effectiveness of their instructional and support programs, and identify areas for improvement. SEAs can most easily obtain postsecondary outcomes data for their high school graduates who enroll at in-state public institutions. To obtain data on students attending out-of-state or private institutions, states may need to subscribe to a proprietary service or organize interstate data exchanges.


Currently, many of the indicators related to student postsecondary outcomes are used solely for program evaluation or accountability. However, aligned longitudinal data across K12 and postsecondary institutions allow for predictive analytics. Students will benefit from understanding the specific achievement targets needed for their ultimate success in college and career based on outcomes data for students who graduated before them. K12 agencies will benefit from understanding the approaches that work best in preparing students for high school graduation and postsecondary education or workforce training, and postsecondary institutions will benefit from understanding the K12 student indicators that contribute to ultimate success in college.

Measure the progress made by education agencies in achieving CCR accountability and continuous improvement goals.

The current CCR focus has begun to shift K12 accountability from a primary emphasis on student proficiency on state assessments to a variety of CCR measures. New accountability reports that focus on college and career readiness rather than proficiency levels may be more understandable, and therefore more meaningful, to parents and the public. Some states produce accountability reports on college and career readiness as well as other mandatory accountability reports. Ideally, CCR accountability reports will include information on the types of resources available to support CCR goals. For example, programs such as Advanced Placement, dual enrollment, and International Baccalaureate can help prepare students for college-level coursework. It would be helpful to stakeholders to understand the extent to which these programs are available in the school or district for which the CCR accountability reports are provided.

Maximize career opportunities for all students.

The career and technical education (CTE) community has had success in connecting workforce and education outcomes data due to its long tradition of cooperation among K12 institutions, community colleges, and workforce agencies. CTE plays an important role



in preparing students for multiple career pathways, including areas requiring a four-year college degree. Since most CTE programs of study require some postsecondary training, it is important that SEAs and LEAs monitor the academic rigor of CTE programs to ensure that students are appropriately prepared for postsecondary learning and careers.

Overarching issues for the use of college and career ready data.

An effective P-20W data governance structure is essential to CCR data availability and appropriate uses. The key to successful data governance is executive buy-in and coordinated communications across all agencies at the state level, and between state data governance structures and local and regional education agencies. The data governance group is responsible for coordinating open communications and transparency with stakeholders, establishing rules for data privacy and security, and promoting data quality. It is critical that states and districts adhere to strict data security and privacy protocols, engage a wide range of stakeholders in the development of new data tools, and publicly post all privacy and usage policies. These preventive measures will help alleviate any potential concerns about security, privacy, and unintended uses of student data, and facilitate the use of student-level data to support college and career readiness.

Special concerns with CCR data.

Data on Soft Skills

CCR metrics generally focus on academic preparedness and participation in specific programs. Although it is widely recognized that soft skills are important to college and career success, defining and measuring these skills in students can be an inexact science. Soft skills are loosely defined as the social and emotional skills and dispositions needed for success in education and the workplace. Attendance and discipline data are sometimes used as proxies for measuring soft skills. Other measurements may come from assessment instruments or, more commonly, teacher or counselor observations. Information on soft skills is needed to support the counseling and advising processes at the school level. Schools and LEAs are largely responsible for determining what methods, if any, would be used for measuring the skills; how those data would be stored; and ultimately using the data to support students. Data collected on student soft skills are usually not stored in a state longitudinal student data system. Thus, the SEA typically has no role to play in the collection and analysis of student soft skill data other than providing longitudinal attendance and discipline data. Data governance at the LEA level would be helpful in making consistent decisions about how soft skills are measured, how the data are stored, and how they are used.

Linking Education and Workforce Data

The use of workforce outcomes data is necessary for evaluating how well students are graduating from high school ready for success in college and career. Connecting education and workforce data presents a significant challenge for most SEAs and LEAs due to the use of Social Security numbers in workforce records and the absence of Social Security numbers in most K12 student information systems. SEAs have used a variety of approaches to matching education and workforce data, but no single solution currently exists.

Appendix A. References and Resources

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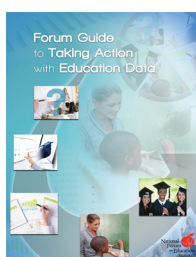
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Additional Resources Available from the National Center on Education Statistics (NCES)

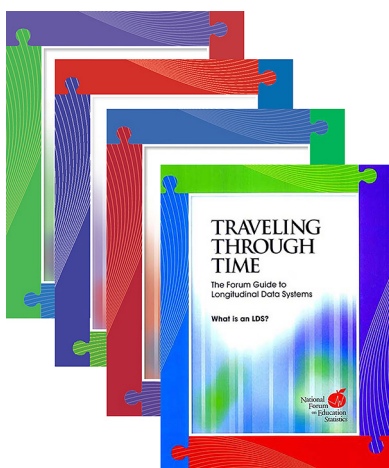
Forum Resources

The following free resources are available at <http://nces.ed.gov/forum/publications.asp>.



Forum Guide to Taking Action with Education Data (2013)

This guide provides practical information about the knowledge, skills, and abilities needed to identify, access, interpret, and use data to improve instruction in classrooms and the operation of schools, local education agencies, and state education agencies.



Traveling Through Time: The Forum Guide to Longitudinal Data Systems (2010-2011)

This is a four-part Forum guide series intended to help state and local education agencies meet the many challenges involved in developing robust longitudinal data systems (LDSs), populating them with quality data, and using this information to improve the education system.

The four books in the series are:

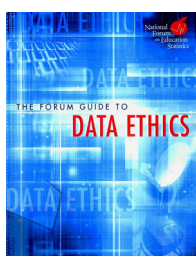
Book I: What is an LDS?

Book II: Planning and Developing an LDS

Book III: Effectively Managing LDS Data

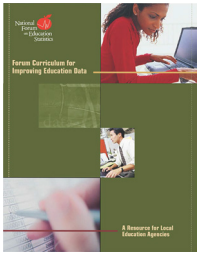
Book IV: Advanced LDS Usage

Each guide is available in print and online.



Forum Guide to Data Ethics (2010)

Each and every day, educators collect and use data about students, staff, and schools. Some of these data originate in individual student and staff records that are confidential or otherwise sensitive. This guide discusses appropriate and ethical use of individual data.



Forum Curriculum for Improving Education Data: A Resource for Local Education Agencies (2007)

This curriculum supports efforts to improve the quality of education data by serving as training materials for K12 school and district staff.

Statewide Longitudinal Data Systems (SLDS) Grant Program Resources

The NCES SLDS Grant Program has developed a number of free resources related to state and local data systems, including the titles listed below. The publications are available for download at <http://nces.ed.gov/programs/slds/publications.asp>.

- *Developing a Data Use Strategy*, August 2013
- *Stakeholder Engagement & Data Use: Helping Stakeholders Get the Most from an SLDS*, May 2013
- *Stakeholder Engagement Toolkit: Traversing 'Stakeholder Land'*, April 2013
- *Engaging Local Stakeholders from Postsecondary and/or Workforce*, May 2013
- *Building a Centralized P-20W Data Warehouse*, March 2013

Additional Resources

Data Catalog Tool for College and Career Readiness Data and Indicators

Developed by the U.S. Department of Education's Regional Educational Laboratory Northeast and Islands (REL-NEI), the *Data Catalog Tool for College and Career Readiness Data and Indicators* is a flexible-use Excel workbook that provides a shell for organizing and tracking student data relevant for measuring college readiness. This data catalog tool and accompanying user guide may help states, districts, and other entities create similar data catalogs to inventory their data systems, assess the availability of college readiness indicators, and identify gaps that may present challenges for indicator systems. The tool is publicly available at <http://www.relnei.org/publications/data-catalogue-tool-for-ccr-indicators.html>.

Making Career Readiness Count

Working with the National Association of State Directors of Career and Technical Education consortium (NASDCTEC), in early 2014 Achieve revised its 2008 publication *Measures that Matter* to incorporate a stronger focus on career readiness. In the new publication, *Making Career Readiness Count*, Achieve maintained its original framework of three indicator categories (course completion/success, achievement, and attainment) with three categories of readiness (toward CCR, meeting CCR, or exceeding CCR). Additional career-ready indicators were added in the three original categories, and a new category of indicators—experiential learning—was added to the framework. The report can be downloaded free at <http://www.achieve.org/publications/making-career-readiness-count>.

Unpacking Career Readiness

Released by ACT in 2015, this research report outlines a model of academic readiness for the workplace that includes work, career, and job readiness. The report calls for a broad model of college and career readiness—a “life skills” framework—that supports a holistic picture of college and career readiness. The paper can be downloaded free at <http://www.act.org/research/policymakers/reports/unpackingreadiness.html>.



Using Data to Increase College and Career Readiness: A Primer for State Policymakers

Written for state policymakers, this guide discusses the role of data in effective college and career ready efforts.

Produced by the Data Quality Campaign in 2012, it can be downloaded free at

http://www.dataqualitycampaign.org/files/1358_DQC-CCR-primer.pdf.

Appendix B. State CCR Definitions

These definitions were initially compiled in early 2014 by the College and Career Readiness and Success Center at the American Institutes of Research. The list below includes several updated definitions provided by Forum members in October 2014.

State	Definition
Alabama	The Alabama Department of Education has adopted the following definition of college and career readiness and included it in its Elementary and Secondary Education Act (ESEA) flexibility request: “Being college and career ready means that a high school graduate has the English and mathematics knowledge and skills necessary to either (1) qualify for and succeed in entry-level, credit-bearing courses without the need for remedial coursework, or (2) qualify for and succeed in the postsecondary job training and/or education necessary for their chosen career (i.e., technical/vocational program, community college, apprenticeship or significant on-the-job training).”
Alaska	Alaska has not adopted or made available a definition of college and career readiness.
Arizona	Arizona has adopted the following definitions of college and career readiness: College ready: Graduating student Is prepared for any postsecondary education or training experience, including study at two- and four-year institutions leading to a postsecondary credential (i.e., a certificate, license, associate or bachelor’s degree); has the English and mathematics knowledge and skills necessary to qualify for and succeed in entry-level, credit-bearing college courses without the need for remedial coursework. Career ready: Job candidate Qualifies for a job that provides a family-sustaining wage and pathways to advancement and requires postsecondary training or education; is a high school graduate and has the English, and mathematics knowledge and skills needed to qualify for and succeed in the postsecondary job training and/or education necessary for their chosen career (i.e., technical/vocational program, community college, apprenticeship or significant on-the-job training).”
Arkansas	Arkansas has adopted the following definition of college and career readiness and included it in an act of the state legislature: “‘College and career readiness’ means the acquisition of skills a student needs to be successful in future endeavors, including: a. Successfully completing credit-bearing, first-year courses at a postsecondary institution; and b. Embarking on a chosen career.”
California	The California Department of Education has not formally adopted a college and career readiness definition. However, on March 3, 2014, the State Superintendent of Public Instruction announced that the Standards for Career Ready Practice are for all students. These standards, in general terms, describe what students need to know to succeed when they transfer to postsecondary education, career training, or the workforce.
Colorado	The Colorado State Board of Education has adopted the following definition of college and career readiness: “The knowledge, skills, and behaviors essential to high school graduates to be prepared to enter college and the workforce and compete in the global economy including content knowledge, learning and behavior skills.”

State	Definition
Connecticut	<p>Connecticut has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>The state has endorsed the Association for Career and Technical Education and National Association of State Directors of Career Technical Education Consortium definition of college and career readiness, which states that readiness “involves three major skill areas: core academic skills and the ability to apply those skills to concrete situations to function in the workplace and in routine daily activities; employability skills (such as critical thinking and responsibility) that are essential in any career area; and technical, job-specific skills related to a specific career pathway. These skills have been emphasized across numerous pieces of research and allow students to enter true career pathways that offer family-sustaining wages and opportunities for advancement.”</p>
Delaware	<p>The Delaware Department of Education has adopted the following definition of college and career readiness:</p> <p>“Each Delaware student will graduate college- and career-ready. Students will be prepared to successfully plan and pursue an education and career path aligned to their personal goals, with the ability to adapt to innovate as job demands change. Students will graduate with strong academic knowledge, the behaviors and skills with which to apply their knowledge, and the ability to collaborate and communicate effectively. Each student should be an independent learner, and have respect for a diverse society and a commitment to responsible citizenship.”</p>
District of Columbia	<p>The District of Columbia has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>College and career readiness is “the level of preparation a student needs in order to enroll and succeed—without remediation—in a credit bearing course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program, or in a high-quality certificate program that enables students to enter a career pathway with potential future advancement.”</p>
Florida	<p>The Florida Department of Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“Students are considered college and career ready when they have the knowledge, skills, and academic preparation needed to enroll and succeed in introductory college credit-bearing courses within an associate or baccalaureate degree program without the need for remediation. These same attributes and levels of achievement are needed for entry into and success in postsecondary workforce education or directly into a job that offers gainful employment and career advancement.”</p>
Georgia	<p>The Georgia Department of Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>College and career readiness is “the level of achievement required in order for a student to enroll in two- or four-year colleges and universities and technical colleges without remediation, fully prepared for college-level work and careers. This means that all students graduate from high school with both rigorous content knowledge and the ability to apply that knowledge.”</p>

State	Definition
Hawaii	<p>Hawaii has adopted the following definition of “college, career and community readiness,” developed by the Hawaii P-20 Partnerships for Education:</p> <p>“Students, who are prepared for meaningful engagement in college, career, and community, have successfully:</p> <ul style="list-style-type: none"> • Achieved proficiency in essential content knowledge; • Mastered key learning skills and cognitive strategies; • Acquired practical knowledge enabling successful transitions from high school to college and career; and • Built a strong foundation of identity through an ongoing process of wayfinding to engage in local, national, and global contexts. <p>By ‘students,’ we mean youth enrolled in Hawai‘i’s public education system recognizing that college, career and community readiness is a lifelong process that begins with early childhood learning.</p> <p>By ‘college,’ we mean two- and four-year post-secondary institutions, trade schools, and technical schools.</p> <p>By ‘career,’ we mean a pathway of employment that provides a family-sustaining wage.</p> <p>By ‘community,’ we mean the set of interdependent relationships among physical, social and/or cultural groups linked by a shared responsibility for one another, the natural world, and local and global well-being.</p> <p>Students have the content knowledge and skills to be eligible to enroll in credit-bearing, postsecondary courses, workforce training and/or apprenticeship programs without the need for remediation, and complete them successfully.</p> <p>Students are able to navigate through postsecondary program selection and admissions, possess the knowledge and skills to enter into and thrive in a family-sustaining career pathway, and utilize strategies to resolve problems and improve academic performance.</p> <p>Wayfinding: Students are able to identify their kuleana and work hard to fulfill these responsibilities to their families, ‘āina, community, and future and past generations.</p> <p>Students know what makes their communities unique and become more involved through opportunities such as volunteer service, ecological stewardship, and civic engagement. Students understand and can comfortably interface with diverse perspectives, cultures, and worldviews to flourish in and sustain local and global communities.”</p>

State	Definition
Idaho	<p>Idaho Professional-Technical Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“Content standards that define what students are expected to know and be able to do to enter and advance in college and/or their careers comprise the foundation of a program of study.</p> <p>Rigorous college and career readiness standards should:</p> <ul style="list-style-type: none"> • Be developed and continually validated in collaboration with secondary, postsecondary, and industry partners. • Incorporate essential knowledge and skills (i.e., academic skills, communication, and problem-solving), which students must master regardless of their chosen career area or program of study. • Provide the same rigorous knowledge and skills in English and mathematics that employers and colleges expect of high school graduates. • Incorporate industry-recognized technical standards that are valued in the workplace. <p>To the extent practicable, be internationally benchmarked so that all students are prepared to succeed in a global economy.”</p>
Illinois	<p>The Illinois State Board of Education has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“Although readiness includes being prepared to take credit-bearing postsecondary courses in core subject areas, Illinois’ college- and career-readiness objectives also extend to developing employability skills and opportunities for students to pursue a personalized education plan based on their academic and career interests.”</p>
Indiana	<p>The Indiana Department of Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“College- and career-ready means an individual has the knowledge, skills and abilities to succeed in post-secondary education and economically-viable career opportunities. Additionally, Public Law 31-2014 [SEA 91] defines college and career readiness educational standards as ‘the standards that a high school graduate must meet to obtain the requisite knowledge and skill to transition without remediation to post-secondary education or training, and ultimately into a sustainable career.’”</p>
Iowa	<p>The Iowa Department of Education has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“College- and career-ready means the acquisition of the knowledge and skills a student needs to enroll and succeed in credit-bearing first-year courses at a postsecondary institution without the need for remediation.”</p>
Kansas	<p>The Kansas State Department of Education has adopted the following definition of college and career readiness:</p> <p>“College and Career Ready means an individual has the academic preparation, cognitive preparation, technical skills, and employability skills to be successful in postsecondary education, in the attainment of an industry recognized certification or in the workforce, without the need for remediation.”</p>

State	Definition
Kentucky	<p>The Kentucky Council on Postsecondary Education has adopted the following definition of college and career readiness:</p> <p>“College readiness is the level of preparation a student needs to succeed in credit-bearing courses in college. ‘Succeed’ is defined as completing entry-level courses at a level of understanding and proficiency that prepares the student for subsequent courses. Kentucky’s system-wide standards of readiness guarantee students access to credit-bearing coursework without the need for remediation in high school or college coursework or intervention programming. Career readiness is the level of preparation a high school graduate needs in order to proceed to the next step in a chosen career, whether that is postsecondary coursework, industry certification, or entry into the workforce.”</p>
Louisiana	Louisiana has not adopted or made available a definition of college and career readiness.
Maine	<p>The Maine Department of Education currently uses the Educational Policy Improvement Center’s definition of college and career readiness. As of June 2014, the definition was under review.</p> <p>“The goal for learners is to graduate from high school ready to enter into post-secondary level coursework (without remediation) or begin a career track in their chosen field, and to enter into civic life. In a proficiency-based system, demonstrating proficiency in all of the standards is evidence that a learner is college- and career-ready.”</p>
Maryland	<p>Maryland has included the following definition of college and career readiness in its ESEA flexibility request:</p> <p>“College- and career-readiness includes mastery of rigorous content knowledge and the abilities to apply that knowledge through higher-order skills to demonstrate success in college and careers. This includes the ability to think critically and solve problems, communicate effectively, work collaboratively, and be self-directed in the learning process. More specifically, a student who is college- and career-ready should: be prepared to succeed in credit-bearing postsecondary introductory general education courses or in industry certification programs without needing remediation; be competent in the Skills for Success (SFS) (includes learning, thinking, communication, technology, and interpersonal skills); have identified potential career goal(s) and understand the steps to achieve them; and be skilled enough in communication to seek assistance as needed, including student financial assistance.”</p>
Massachusetts	<p>The Massachusetts Department of Education has adopted the following definition of college and career readiness approved by the Board of Elementary and Secondary Education and Massachusetts Board of Higher Education:</p> <p>“Massachusetts students who are college and career ready will demonstrate the knowledge, skills and abilities that are necessary to successfully complete entry-level, credit-bearing college courses, participate in certificate or workplace training programs, and enter economically viable career pathways. In order to meet this goal, the Commonwealth has defined a set of learning competencies, intellectual capacities and experiences essential for all students to become lifelong learners; positive contributors to their families, workplaces and communities; and successfully engaged citizens of a global 21st century. Beyond achieving college and career ready levels of competence in English Language Arts/Literacy and Mathematics, all high school students should develop a foundation in the academic disciplines identified in the MassCore course of study: (1) build competencies for workplace readiness as articulated in the Integrating College and Career Task Force Report, and (2) focus on applying academic strategies to problem solving in diverse professional and life contexts, appropriate to individual student goals. Massachusetts will use its 2011 curriculum frameworks, which include the Common Core State Standards, as the basis for an educational program that provides students with the academic knowledge, skills and experience.</p>

State	Definition
Massachusetts (continued)	<p>Learning Competencies:</p> <p>College and career ready students in English Language Arts/Literacy will be academically prepared to:</p> <ul style="list-style-type: none"> • Read and comprehend a range of sufficiently complex texts independently • Write effectively when using and/or analyzing sources • Build and present knowledge through research and the integration, comparison, and synthesis of ideas • Use context to determine the meaning of words and phrases <p>College and career ready students in Mathematics will be academically prepared to:</p> <ul style="list-style-type: none"> • Solve problems involving the major content with connections to the mathematical practices • Solve problems involving the additional and supporting content with connections to the mathematical practices • Express mathematical reasoning by constructing mathematical arguments and critiques • Solve real world problems, engaging particularly in the modeling practice <p>Work Ethic and Professionalism</p> <ul style="list-style-type: none"> • Attendance and punctuality expected by the workplace • Workplace appearance appropriate for position and duties • Accepting direction and constructive criticism with a positive attitude and response • Motivation and taking initiative, taking projects from initiation to completion • Understanding workplace culture, policy and safety, including respecting confidentiality and workplace ethics • Effective communication and interpersonal skills • Oral and written communication appropriate to the workplace • Listening attentively and confirming understanding • Interacting with co-workers, individually and in teams <p>In high school, students should demonstrate:</p> <ul style="list-style-type: none"> • Higher order thinking skills of analysis, synthesis, and evaluation • The ability to think critically, coherently, and creatively • The ability to direct and evaluate their own learning, be aware of resources available to support their learning, and have the confidence to access these resources when needed. • Motivation, intellectual curiosity, flexibility, discipline, self-advocacy, responsibility, and reasoned beliefs.”
Michigan	<p>The Michigan Department of Education has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“We define [college and career readiness] as student preparation that is adequate to allow a student to pass first-year technical training and first-year college courses in core areas without remediation. Our state is preparing students not just for the opportunities we know about today, but also for the economic and intellectual challenges of the future.”</p>
Minnesota	<p>For purposes of statewide accountability, “career and college ready” means a high school graduate has the knowledge, skills, and competencies to successfully pursue a career pathway, including postsecondary credit leading to a degree, diploma, certificate, or industry-recognized credential and employment. Students who are career and college ready are able to successfully complete credit-bearing coursework at a two- or four-year college or university or other credit-bearing postsecondary program without need for remediation.</p>

State	Definition
Mississippi	Mississippi has not adopted or made available a definition of college and career readiness.
Missouri	<p>Missouri has adopted the following definition of college and career readiness:</p> <p>“College and career readiness means that a high school graduate has the necessary English and mathematics knowledge and skills—including, but not limited to, reading, writing, communications, teamwork, critical thinking and problem solving—either to qualify for and succeed in entry-level, credit-bearing two- or four- year college courses without the need for remedial coursework, or in workforce training programs for his/her chosen career that offer competitive, livable salaries above the poverty line, offer opportunities for career advancement, and are in a growing or sustainable industry.”</p>
Montana	Montana has not adopted or made available a definition of college and career readiness.
Nebraska	<p>The Nebraska Department of Education has adopted the following definition of career readiness:</p> <p>“A career ready person capitalizes on personal strengths, talents, education and experiences to bring value to the workplace and the community through his /her performance, skill, diligence, ethics and responsible behavior [...] When students are career ready, they are prepared for the next step in their lives—whether that means getting their first job or beginning their college ‘career’ (which eventually leads to the workplace as well)! Being career ready also means being ready for life.”</p>
Nevada	<p>Nevada has adopted the following definition of college readiness:</p> <p>“‘College readiness’ [is] the demonstrated proficiency of a high school graduate to participate and succeed in an academic program leading to completion of a 2-year or 4-year college degree program.”</p>
New Hampshire	<p>The New Hampshire Department of Education has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“College and career ready means that students graduate from high school prepared to enter and succeed in postsecondary opportunities—whether college or career—without need for remediation.</p> <ul style="list-style-type: none"> • Students should graduate fully prepared to pursue the college and career options of their choice. • College ready refers to the full range of programs leading to valuable, recognized degrees, including community colleges and four-year colleges. • Career ready refers to employment opportunities with meaningful opportunities for advancement as well as career training programs that offer technical certification or other marketable skills. • Evidence and experience indicate that the knowledge and skills needed to succeed in college and career are greatly similar, and that all graduates will need some form of postsecondary education or training to succeed during their careers. <p>To be college and career ready, students must graduate with the knowledge, skills and dispositions necessary to succeed. These are the kinds of deeper learning outcomes that are at the heart of being college and career ready.</p> <ul style="list-style-type: none"> • Knowledge, skills and dispositions are mutually reinforcing, and not contradictory. That is, evidence and experience confirm that education that advances application of knowledge through skills is more likely to result in student competency of the underlying, rigorous content knowledge. • The knowledge, skills and dispositions have concrete meaning and can be expressly taught, learned, and measured. This will require multiple, robust measures or evaluation and assessment. <p>This same set of knowledge, skills and dispositions is also vital for student success in terms of citizenship, in addition to college and career readiness, including the ability to contribute and succeed in our increasingly diverse, democratic, global society.”</p>

State	Definition
New Jersey	<p>The New Jersey Department of Education has adopted the following definition of college and career readiness:</p> <p>“The knowledge and skills that high school graduates must possess in English and mathematics—including, but not limited to, reading, writing, communications, teamwork, critical thinking, and problem solving—to be successful in any and all future endeavors.”</p>
New Mexico	New Mexico has not adopted or made available a definition of college and career readiness.
New York	New York has not adopted or made available a definition of college and career readiness.
North Carolina	North Carolina has not adopted or made available a definition of college and career readiness.
North Dakota	North Dakota has not adopted or made available a definition of college and career readiness.
Ohio	<p>The Ohio Department of Education has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“Ohio’s college- and career-ready definition is to ensure all students ‘Start Ready and Graduate Ready’ from their PreK–12 learning environment, qualified for success in a degree or credential-granting postsecondary education program, without remediation, and advanced training for a career of choice. Student readiness for college and careers includes: Content Knowledge: A deep core-content knowledge in academic and applicable technical content; 21st Century Skills: The effective use of academic and technical skills (e.g., research, problem-solving, systems thinking); Readiness Behaviors: The acquisition of readiness behaviors such as goal-setting, persistence, and resourcefulness; College and Career Survival Skills: The acquisition of knowledge and skills needed to navigate successfully within the world of higher education and world of work.”</p>
Oklahoma	<p>The Oklahoma State Department of Education has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>Oklahoma is implementing the College, Career and Citizen Ready (C³) plan, “which will ensure each student graduating with a diploma from an Oklahoma public school will be ready for college or career without the need for remediation and will be citizen ready, meaning they will know something about our government and the history of our nation.”</p>
Oregon	<p>The Oregon Department of Education has adopted the following definition of college and career readiness:</p> <p>“College- and Career-Ready Oregonians have acquired knowledge, skills, and professional behaviors that provide a starting point to enter and succeed in workplace, career training, or college courses leading to certificates or degrees.</p> <p>A College- and Career-Ready Oregonian ...</p> <ul style="list-style-type: none"> • Reasons, researches, analyzes logically in order to investigate topics, and to evaluate, integrate, and present ideas and information • Exhibits the following attributes: reflection, curiosity, openness, internal motivation, persistence, resilience, and flexibility • Evaluates and/or applies prior knowledge of content and situations, including cultural understanding, to support comprehension • Tracks and reflects on progress toward educational and vocational goals • Employs effective speaking and active listening strategies for a range of purposes, audiences, and contexts • Distinguishes between opinions, interpretations, and facts • Uses technology to access and evaluate the reliability, credibility, and utility of information and is able to produce and/or present information

State	Definition
Oregon (continued)	<ul style="list-style-type: none"> • Locates, analyzes and critiques perceptions, information, ideas, arguments, and/or themes in a variety of text • Produces clear, effective, and accurate writing grounded in textual evidence for a range of purposes, genres, and audiences • Constructs clear and precise arguments to support their reasoning and to critique the reasoning of others • Explains and applies mathematical concepts, carrying out mathematical procedures with precision and fluency in a variety of settings • Solves a range of complex problems in pure and applied mathematics • Makes productive use of knowledge and problem solving strategies • Analyzes complex, real-world scenarios <p>A College and Career Ready Oregonian ...</p> <ul style="list-style-type: none"> • Has positive values such as: caring, equity, integrity, honesty, responsibility, and restraint • Practices personal, time, and budget management through planning and decision-making • Has a sense of support and empowerment • Is able to self-advocate • Engages in civic and community activities • Works productively in new cultural settings • Relates and responds to individuals from various cultures • Works productively in teams • Understands postsecondary education options, expectations, costs, and processes • Understands and evaluates career options and pathways • Understands workplace requirements and business cultures • Has appropriate interviewing skills • Is timely and reliable • Has appropriate workplace behaviors and occupation-specific skills • Is able to accept and use feedback <p>Has both personal and academic integrity and is an ethical decision maker.”</p>
Pennsylvania	Pennsylvania has not adopted or made available a definition of college and career readiness.
Puerto Rico	Puerto Rico has not adopted or made available a definition of college and career readiness.
Rhode Island	Rhode Island has not adopted or made available a definition of college and career readiness.
South Carolina	South Carolina has not adopted or made available a definition of college and career readiness.
South Dakota	South Dakota has not adopted or made available a definition of college and career readiness.
Tennessee	<p>The Tennessee Department of Education has adopted the following definition of college and career readiness:</p> <p>“Tennessee defines college and career readiness as ‘... the knowledge and skills needed for entry-level work and college freshmen coursework [and] success whether pursuing a career or a college education.’”</p>

State	Definition
Texas	<p>The Texas Education Agency has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“College readiness is the level of preparation a student must attain in English language arts and mathematics courses to enroll and succeed, without remediation, in an entry-level general education course for credit in that same content area for a baccalaureate degree or associate degree program. It should be noted, however, that the measurement of college readiness through the Algebra II and English III assessments will be only one piece of information that students, parents, and schools will have in making readiness determinations. Algebra II and English III are courses students typically take in grade 11; after students have taken these assessments and potentially met the college-readiness performance standards, they will continue to take higher-level courses (i.e., calculus and English IV) in grade 12. Students will need to continue to acquire content knowledge and perform at a high level in these courses to fully prepare for postsecondary activities.”</p>
Utah	<p>The Utah State Office of Education and the Utah System of Higher Education have adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“A college- and career-ready student is prepared to succeed in college and postsecondary workforce training programs. A college- and career-ready student builds an academic foundation, develops intellectual and career capacity, evaluates progress for college, and explores postsecondary options.”</p>
Vermont	<p>The Vermont Agency of Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“‘College and Career Readiness’ means the student’s ability to enter the workforce or pursue postsecondary education or training without the need for remediation. The student must possess the foundational skills and learning strategies necessary to begin studies in a career pathway in order to be considered college and career ready.”</p>
Virginia	<p>The Virginia Department of Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>Virginia defines college readiness as “the level of achievement students must reach to be academically prepared for success in entry-level credit-bearing college courses.”</p>
Washington	<p>The Washington Office of the Superintendent of Public Instruction has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“The purpose of the diploma is to declare that a student is ready for success in postsecondary education, gainful employment, and citizenship, and is equipped with the skills to be a lifelong learner. The diploma represents a balance between the personalized education needs of each student and society’s needs, and reflects, at its core, the state’s basic education goals.”</p>
West Virginia	<p>The West Virginia Department of Education has adopted the following definition of college and career readiness and made it available through publication to the general public:</p> <p>“College and Career Readiness means that students exit high school prepared for success in a wide range of high-quality post-secondary opportunities. Specifically, college and career readiness refers to the knowledge, skills, and dispositions needed to be successful in postsecondary education and/or training that lead to gainful employment. Today’s workplace requires that all workers be lifelong learners in order to advance in their careers. Therefore, it is necessary that there be a common set of knowledge and skills that all individuals acquire to successfully transition into postsecondary education or the workplace. As individuals select specific career paths, they will then have to focus on the amount and type of additional knowledge and skills they should acquire to be successful in their chosen field. A student’s goals, desires, and interests influence the precise knowledge and skill profile necessary to be ready for success in their chosen postsecondary endeavors and the level of postsecondary education needed to accomplish a student’s individual career aspirations. All students should exit high school with a full understanding of the career opportunities available to them, the education necessary to be successful in their chosen pathway, and a plan to attain their goals.”</p>

State	Definition
Wisconsin	<p>The Wisconsin Department of Public Instruction has adopted the following definition of college and career readiness and included it in its ESEA flexibility request:</p> <p>“Students who are college and career ready have, upon graduation, the knowledge, habits, and skills needed to succeed in postsecondary education and/or training that maximize their options and opportunities to successfully participate in productive and sustainable employment.”</p>
Wyoming	Wyoming has not adopted or made available a definition of college and career readiness.

Appendix C. College and Career Readiness and Success Organizer

The College and Career Readiness and Success Organizer was created by the College and Career Readiness and Success Center at the American Institutes of Research under a grant from the U.S. Department of Education. The matrix below summarizes the four strands of the Organizer. For more information about the Organizer, see <http://tinyurl.com/o7vny8z>.

Strand 1: Goals and Expectations <i>What should learners know and be able to do to achieve college and career readiness?</i>	
THREADS	COMPONENTS
Academic Content	<ul style="list-style-type: none"> • State content standards • State and industry technical standards
Pathway Knowledge	<ul style="list-style-type: none"> • Knowledge of college and career pathway options • Knowledge of personal interests and skills and related pathways • Personal goals and aspirations
Lifelong Learning Skills	<ul style="list-style-type: none"> • Social and emotional skills • Higher-order thinking skills • Application of knowledge in cross-disciplinary contexts • Academic success and employability skills • Civic skills • Technology skills • Financial literacy and consumer skills

Strand 2: Outcomes and Measures <i>How do we know when learners are meeting expectations for college and career readiness and success?</i>	
THREADS	COMPONENTS
On-track Indicators for Readiness	<ul style="list-style-type: none"> • Attendance • Course performance • Course completion • Performance on summative assessments • Behavior and conduct • Social and emotional learning benchmarks • Coursetaking patterns • Postsecondary aspirations
Measures of Postsecondary Readiness	<ul style="list-style-type: none"> • Progress toward credentials • High school graduation • Postsecondary enrollment in credit-bearing courses • Industry certification • Persistence in postsecondary pathways
Measures of Postsecondary Success	<ul style="list-style-type: none"> • Job placement in middle skills or higher position with career trajectory • Stackable postsecondary credentials • College diploma

Strand 3: Pathways and Supports	
<i>What should institutions provide to enable learners to achieve college and career success?</i>	
THREADS	COMPONENTS
Academic Organization	<ul style="list-style-type: none"> • Curriculum instruction and assessment • Multiple pathways to postsecondary opportunities • Work- and context-based learning experiences • Cross-disciplinary connections
Supports	<ul style="list-style-type: none"> • Individualized learning strategies for all students • Targeted and intensive interventions • Wraparound services
Enrichment and Preparation	<ul style="list-style-type: none"> • Setting goals for postsecondary pathways • Exploring college and career options • Guidance on postsecondary transitions

Strand 4: Resources and Structures	
<i>What do institutions need to enable learner readiness for college and careers?</i>	
THREADS	COMPONENTS
Resources	<ul style="list-style-type: none"> • Human capital • Fiscal resources • Physical resources • Data systems and multiple measures • Accessible learning resources • Information and instructional technologies
Processes	<ul style="list-style-type: none"> • Professional development • Family and community engagement • Building capacity • Internal alignment across programs and initiatives • External alignment across systems and institutions • Safety and security • Monitoring
Feedback	<ul style="list-style-type: none"> • Accountability • Data-informed improvement cycles • Evaluation of programs and resources

Appendix D. CCR Data Elements and CEDS

The following table represents a crosswalk between key data needs identified in the five use cases presented in Chapter 2 and related data elements included in the Common Education Data Standards (CEDS). In some cases, the college and career ready (CCR) data would need to be derived or aggregated from the associated CEDS elements. Also shown with the CEDS elements is the related domain->entity->category for each element. The primary purpose of the crosswalk is to leverage the CEDS data element definitions and options sets for use with the CCR data. To access the definitions and option sets for the CEDS elements, go to <https://ceds.ed.gov/elements.aspx>, filter on “All CEDS Elements,” and search for the data elements alphabetically.

K12 Student-Level Elements

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Age	Birthdate K12->K12 Student->Demographic		X			
Attendance	Attendance Status Attendance Event Type K12->K12 Student->Attendance	X	X		X	
Cohort graduation year	Cohort Year Cohort Graduation Year K12->K12 Student->Enrollment	X	X	X	X	X
Course taking, course grades, and credit accumulation	Course Section Identifier K12->Course Section->Directory Course Section Enrollment Status Type Course Section Enrollment Status Start Date Course Section Enrollment Status End Date K12->K12 Course Section->Enrollment Course Title Course Identifier Course Code System Credits Earned Cumulative Student Course Section Grade Earned K12->K12 Student->Academic Record	X	X	X		X

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Demographics	American Indian or Alaska Native Asian Black or African American Hispanic or Latino Ethnicity Native Hawaiian or Other Pacific Islander White Demographic Race Two or More Races Sex K12->K12 Student->Demographic Economic Disadvantage K12->K12 Student->Economically Disadvantaged Disability Status K12->K12 Student->Disability Homelessness Status K12->K12 Student->Homeless Title III Immigrant Status K12->K12 Student->Immigrant Limited English Proficiency Status K12->K12 Student->Limited English Proficiency Migrant Status K12->K12 Student->Migrant Neglected or Delinquent Status K12->K12 Student->Neglected or Delinquent	X	X	X	X	X
Discipline	Disciplinary Action Taken K12->K12 Student->Discipline		X			
Enrollment data	Enrollment Entry Date Entry Type Entry Grade Level Exit Date Exit or Withdrawal Type School Identifier Local Education Agency Identifier Responsible School Identifier Responsible District Identifier K12->K12 Student->Enrollment	X	X	X	X	X
FAFSA application completion	Financial Aid Applicant Financial Aid Application Type Postsecondary->PS Student->Financial Aid	X				

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Grade point average	Grade Point Average Cumulative K12->K12 Student->Academic Record	X	X			X
High school credentials earned	High School Diploma Type High School Diploma Distinction Type Professional or Technical Credential Conferred Diploma or Credential Award Date K12->K12 Student->Academic Record	X		X	X	X
Identification data	First Name Middle Name Last or Surname Generation Code or Suffix K12->K12 Student->Identity->Name Student Identifier K12->K12 Student->Identity->Identifier	X	X	X		X
Individualized learning plan information	Career Education Plan Date Career Education Plan Type Career and Technical->CTE Student->Career Education Plan K12->K12 Student->Individualized Program Career Cluster Career and Technical->CTE Student->Program Participation Individualized Program Service Plan Date Individualized Program Type K12->K12 Student->Individualized Program	X				X
Mobility	Can be derived from 'Enrollment Data' above		X			
Performance on college entrance exams	Standardized Admission Test Type Standardized Admission Test Score Postsecondary->PS Student->Application	X		X	X	X
Performance on formative assessments or diagnostic tests	Assessment Type K12 ->Assessments ->Assessment Assessment Result Score Value K12->Assessments->Assessment Result	X	X			
Performance on industry-recognized certification exam	Assessment Type K12 ->Assessments ->Assessment Postsecondary->Assessments Assessment Result Score Value K12->Assessments->Assessment Result Postsecondary->Assessments					

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Performance on specialized tests - soft skills	Assessment Type K12 ->Assessments ->Assessment Assessment Score Value K12->Assessments->Assessment Result Score Value	X				
Performance on state assessments	Assessment Type K12 ->Assessments ->Assessment Proficiency Status K12 ->K12 Student ->Academic Record	X	X	X	X	X
Postsecondary applications completed	Postsecondary Applicant Postsecondary -> PS Applicant	X				
Postsecondary credits earned through dual enrollment	Dual Credit Dual Enrollment Credits Awarded Postsecondary -> PS Student -> Academic Record	X		X		X
Program participation - accelerated learning	Course Level Characteristic K12->K12 Course	X	X	X	X	X
Program participation - basic	Program Type Program Participation Status Program Participation Start Date Program Participation Exit Date Exit Reason Program Identifier Program Name K12->K12 Student->Program	X	X	X	X	X
Program participation - career focus (e.g. CTE or Junior ROTC (use 'other' as Program Type for Junior ROTC))	Program Type Program Participation Status Program Participation Start Date Program Participation Exit Date Exit Reason Program Identifier Program Name K12->K12 Student->Program	X	X	X	X	X
Program participation - CCR support (use option 'other' for Program Type) or intervention services	Program Type Program Participation Status Program Participation Start Date Program Participation Exit Date Exit Reason Program Identifier Program Name K12->K12 Student->Program	X	X	X	X	X

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Program participation – work-based learning	Work-based Learning Opportunity Type Program Participation Status Program Participation Start Date Program Participation Exit Date Exit Reason Program Identifier Program Name K12 ->K12 Student ->Program Employed While Enrolled Employed After Exit Employment NAICS Code Employment End Date Employment Start Date K12 ->K12 Student ->Employment	X				X
Retention	Can be derived from ‘Enrollment Data’ above.		X			

Teacher-Student Data Link Elements

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Teacher-student data link	Student Identifier K12->K12 Student->Identity->Identifier Course Section Identifier K12->Course Section->Directory Course Section Enrollment Status Type Course Section Enrollment Status Start Date Course Section Enrollment Status End Date K12->Course Section->Enrollment Teacher of Record K12 ->Course Section ->Staff Staff Member Identifier K12 ->K12 Staff ->Identity ->Identification Teacher Student Data Link Exclusion Flag K12 ->Teacher Student Data Link Exclusion		X	X		X

K12 Staff – Teacher Preparation Program Link

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Staff identifier	Social Security Number K12 ->K12 Staff ->Identity ->Identification		X			
Postsecondary student identifier	Social Security Number Postsecondary ->PS Student ->Identity ->Identification		X			
Postsecondary institution name	Name of Institution Postsecondary -> PS Institution ->Directory		X			
Teacher training program	Teacher Preparation Program Completer Status Postsecondary ->PS Student ->Teacher Education/Preparation		X			

Postsecondary Student-Level Elements

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Coursetaking and course grades, including enrollment in remedial, non-credit-bearing courses	Postsecondary Course Title Agency Course Identifier Postsecondary ->PS Section ->Course					
	Course Level Type Postsecondary ->PS Section			X	X	X
Credits earned	Course Academic Grade Postsecondary ->PS Section ->Enrollment					
	Course Credit Value (need to aggregate for cumulative credits earned) Postsecondary ->PS Section ->Course			X	X	X

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Enrollment in postsecondary institution, including postsecondary identifier and entry and exit dates	Classification of Instructional Program Code Enrollment in Postsecondary Award Type Postsecondary ->PS Student ->Institution Enrollment->Program First Time Postsecondary Student Entry Date into Postsecondary Exit Date Initial Enrollment Term Postsecondary ->PS Student ->Institution Enrollment Postsecondary Enrollment Type Postsecondary Enrollment Status Postsecondary ->PS Student ->Term Enrollment Name of Institution Postsecondary ->PS Institution ->Directory Institution IPEDS Unit ID Postsecondary ->PS Institution ->IPEDS Reporting			X	X	X
Identification data	First Name Middle Name Last or Surname Postsecondary ->PS Student ->Identity ->Name Student Identifier Social Security Number Postsecondary -> PS Student ->Identity -> Identification			X	X	X
Postsecondary degree or certification	Degree or Certificate Type Degree or Certificate Conferring Date Career and Technical ->CTE Student ->Academic Record Professional or Technical Credential Conferred Postsecondary ->PS Student ->Academic Record->Academic Award			X		X

Workforce Elements

CCR Data	CEDS Elements	Use Case #1	Use Case #2	Use Case #3	Use Case #4	Use Case #5
Earnings	Quarterly Earnings Workforce -> Quarterly Employment Record				X	X
Employee Identification	First Name Middle Name Last Name or Surname Generation Code or Suffix K12 -> K12 Student -> Identity -> Name Postsecondary -> PS Student -> Identity -> Name Career and Technical -> CTE Student -> Identity -> Name Social Security Number Workforce -> Quarterly Employment Record K12 -> K12 Student -> Identity -> Identification Postsecondary -> PS Student -> Identity -> Identification Career and Technical -> CTE Student -> Identity -> Identification				X	X
Employment status after graduation	Employed After Exit K12 -> K12 Student -> Employment Postsecondary -> PS Student -> Employment Workforce -> Quarterly Employment Record				X	X
Industry in which employed	Employment NAICS Code Workforce -> Quarterly Employment Record				X	X
Military enlistment	Military Enlistment After Exit Workforce -> Quarterly Employment Record				X	X