California Cradle-to-Career Data System Assessment of Operational Tools

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As required in the California Cradle-to-Career Data System Act, the partner entities have included tools designed to support practitioners and students in phase one of a state data system. After studying several different options, the partner entities elected to focus on several types of operational supports: [1]

- Electronic Transcripts
  - Provide a consistent platform that streamlines college, financial aid, and transfer application processes for students and institutions
  - Expand the types of records that can be shared for adults pursuing employment-related training, such as competency-based credentials, experiential transcripts, e-portfolios, certifications, and badges
- Eligibility
  - Enable students to authorize information-sharing that would qualify them for support services, such as whether they are socioeconomically disadvantaged, first generation college-going, homeless, or foster youth
- College Planning
  - Provide K–12 districts with the tools and curriculum needed to systematize college and career guidance practices
- College Readiness and Transfer Monitoring
  - Allow students, parents, educators, and counselors to monitor factors that influence college-going and retention rates, such as completion of a-g or community college transfer requirements, submission of financial aid applications, and eligibility for non-remedial math and English courses

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[1] See the Student Records and Planning Use Case at
https://wested.box.com/s/x4oq1x1saxpzz5olp1mvawxr59e8bv7i

- Data Cleanup
    - Identify instances where information is inaccurate in local student information systems and support educational institutions to correct this information

At the April 2020 Cradle-to-Career Workgroup meeting, the partner entities voted to deliver these services by scaling two efforts currently underway in California: the California College Guidance Initiative (CCGI) and eTranscript California. Before finalizing the recommendation, however, workgroup members requested additional information on the efficacy of these types of tools, including research about the impact of planning, monitoring, and electronic transcript tools and more information about the specific ways in which CCGI and eTranscript California provide these services.

This background paper provides a review of the literature and examples from states that are using these types of tools on a regional or statewide basis. While evaluations of these tools are somewhat limited, the literature does provide information on some of the practices and features considered to be most effective, as well as key implementation concerns for scaling. The paper then assesses how CCGI and eTranscript California address some of the key goals established by the workgroup. This paper has two companion pieces. One provides a high-level overview of this report. The second provides legal and technical models for implementation.

Literature Review and Environmental Scan

College and Career Planning Tools and Monitoring Tools

A number of researchers studying ways to improve students' college readiness and success have recommended a combination of easier access to information and better information (Shulock & Koester, 2014; Executive Office of the President, 2014; Complete College America, 2011; Turner, 2004; Bankert et al., 2020). Lack of college knowledge poses a particular challenge for first-generation and low-income students (Shulock & Koester, 2014), making access to information even more critical for these populations of students. Programs that guide students through a planning process that starts early on in their educational career, educates them on various college and career options, and provides detail on the cost of education and training have been shown to help improve college-going rates and reduce time to degree (Complete College America, 2011; Executive Office of the President, 2014; Shulock & Koester, 2014). However, a recent assessment of college advising programs noted that, to be effective, these

programs first need to build buy-in among stakeholders. Implementors must take time to engage educators and make the case that postsecondary success should be a unifying goal and purpose of K–12 education. After case-making, key implementation factors include: a focus on data in order to track, report, share, and discuss progress towards postsecondary goals; ensuring equitable access; and creating sustainable funding and support (Bankert et al., 2020).

While there is much information on the importance of providing information to students early on, research specifically on the efficacy of online planning tools is more limited. Studies of the Naviance tool have indicated that it can be effective in improving application rates (Christian et al., 2011) and increasing awareness of a wider array of college options, especially for students of color and low-income students (Mulhern, 2019; Tate, 2019). These studies also found that students who logged into the system more frequently tended to have higher application rates. This result was consistent with previous findings that students who reported having more access to school counselors for college information had a higher college application rate (Christian et al., 2011).

An evaluation of a career readiness initiative in Kentucky that included a tool designed to help students explore career options and develop a career plan found little impact on student outcomes, in part because so few students were ultimately exposed to the tool (Phillips et al., 2018). While the study found little overall evidence of impact because of the lack of widespread use, researchers did note several key factors for the success of this type of effort. First, it is important to make the case to potential users in order to garner buy-in from the outset. Second, fully understanding the technical and infrastructure capacities of the school sites before adopting an online planning system is important; if the capacity is not there, the tools are not going to be utilized (Phillips et al., 2018).

While planning tools help to provide students with information on college and career options and encourage goal setting based on that information, ensuring that students stay on track towards meeting those goals often requires additional monitoring and guidance. Several research studies have shown that early monitoring is particularly important, especially when accompanied by active supports along the way (Valliani, 20015a, 20015b; Bankert et al., 2020). A research study on two ACT programs, for example, showed positive impacts of early monitoring of student progress in terms of high school course taking, educational and career planning, and increased college enrollment, achievement, and persistence (ACT, 2012). Researchers followed students who only took the ACT compared to students who both took the ACT and participated

in one or more of the ACT planning tools (Explore or PLAN) and found that those who were monitored early were more likely to enroll in college and more likely to re-enroll in the second year. Those who participated in both ACT and PLAN also had higher GPAs (ACT, 2012). The ability of practitioners to use data to identify students early on who are not on track for certain milestones is critical to providing interventions that can alter that trajectory.

Tools: Examples from the States

The **Virginia** Education Wizard tool was developed by the state's community college system in 2009. To design the tool, developers surveyed students, counselors, and others who work directly with students to understand what kind of tool different stakeholders felt would be helpful. The tool includes a course planner, information on transfer options, and a career planning tool. Tabs are available for different groups of users, including students, veterans, and those seeking skills training. An early evaluation of the tool showed some correlation between use of the education wizard and student success (Herndon, 2011). The tool has expanded over the years and is now embedded in the public school system. All K–12 and community college students automatically have accounts, and the tool is used in adult education and workforce programs as well. In the past year over 700,000 career assessments were completed. According to Rachel Angel, coordinator for the Virginia Education Wizard, "It's clear that embedding a consistent and robust career exploration tool in schools at no charge to them, with the full partnerships of the states' Department of Education, makes all the difference."[2]

Kentucky has developed a new career exploration tool as part of its KYStats website. The tool includes a self-assessment of knowledge and skills, and information on education and training needed for various pathways. It also provides information on the entities in the state that offer the education and training needed for the degrees or certifications associated with a chosen career path.[3]

Both **South Carolina** (SC TRAC) and **Pennsylvania** (PA TRAC) have state planning tools specifically for students interested in transferring from a two-year to four-year college. The tools, developed by Academy One, are designed for high school students, community college students, and veterans. For example, secondary students can learn

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2 Email communication with Rachel Angel, June 5, 2020. For more information on the Virginia Education Wizard, see https://www.vawizard.org/wizard/home

3 For more information on the Kentucky Career Explorer Tool, see https://kystats.ky.gov/CareerExplorer

how to earn college credit while still in high school. The tools also allow students to compile course histories, compare which credits will transfer to different colleges in the system, and track progress towards meeting transfer goals.[4]

Starting in 2018, the **Hawai'i** Department of Education used its longitudinal data system to create the On Track Dashboard, which highlights key factors associated with on-time progress towards high school graduation. Together with local instructional leaders and data management staff, the department developed and tested interactive tables and charts that help identify students at risk of not graduating. Educators use the information to plan interventions that are tailored to individual students. The tool has been heavily used and feedback on the value of the tool has been positive.[5]

In **Texas**, data dashboards developed as a part of the Dallas Promise pledge provide real-time information to teachers and counselors on students' grades, test scores, and other academic factors. Educators can use this information to help students stay on track for graduation. Information is color-coded to indicate whether students have excelled, just missed a milestone, or are in need of significant support. In at least one school district, the ability to "track each student's unique path toward college and career, identify roadblocks quickly, and anticipate the need for support faster" has led to an increase in both college enrollment and Free Application for Federal Student Aid (FAFSA) completion.[6]

Effective Practices and Key Implementation Considerations

Based on the literature review and the planning and monitoring tools currently in use in other states, we can identify several effective practices and implementation considerations that will be important in assessing operational tools for California:

- **Provide information early, accompanied by monitoring and support** to ensure that students take the appropriate courses in high school and develop a better understanding of college options

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4 For more information on SC TRAC, see https://www.sctrac.org; for more information on PA TRAC, see https://www.patrac.org

5 For more information, see https://slds.grads360.org/services/PDCService.svc/GetPDCDocumentFile?fileId=33098

6 See, for example, https://www.edsurge.com/news/2020-01-21-students-face-a-troubling-skills-gap-around-career-readiness-we-re-fixing-it-with-data

- **Individualize information** so students are better able to make decisions using guidance that is tailored to their specific goals and interests
- For those who work to support students, **make data easy to access and show clear indications of progress towards milestones**
- Encourage **frequent, regular use** to generate greater impact
- Build buy-in from the practitioners and systems who will use the tools by **clearly communicating how the tools support overall institutional or system goals**
- Ensure widespread adoption and implementation of the tools by including capacity building, including conducting robust **assessments of local technical capabilities and infrastructure**

Financial Aid Information and Assistance

In addition to college and career planning and progress monitoring, several tools also address financial aid and affordability. Access to this information is particularly important for low-income students, many of whom may think that higher education is cost prohibitive and are not aware of their eligibility for financial aid. Valliani (2015a, 2015b) notes that concerns about the cost of college and the lack of information about financial aid opportunities and eligibility also keep Latinx and Black students from enrolling in college, particularly four-year institutions. Researchers have also found that low- and moderate-income students who attend community college are the least likely to file the FAFSA, compared with peers at other institutions (JBL Associates, 2010).

While the perception of not being able to afford college can serve as a barrier, Valliani finds that students "who are knowledgeable about financial aid are more likely to go to college, enroll in a four-year university, and attend full-time" (Valliani, 2015b, p. 13). Researchers have shown that simple interventions such as providing specific information on expected costs and financial aid supports increases college application submissions (Hoxby & Turner, 2013). The combination of information on financial aid with assistance in the FAFSA application process yields even stronger outcomes in terms of application submission, college enrollment, and amount of aid received (Bettinger et al., 2012).

Tools: Examples from the States

The College Foundation of **North Carolina** (CFNC) is a free service provided through a collaborative effort that includes the Department of Public Instruction, the community college system, the independent colleges and universities, the University of North Carolina system, the North Carolina State Education Assistance Authority, and College

Foundation, Inc. CFNC promotes access to North Carolina higher education and assists students with education planning, career planning, college applications, and paying for college. CFNC provides its services primarily through its website. Users can launch the FAFSA application, obtain free financial aid counseling, explore college options, and launch college applications all from one portal, thus reducing barriers to college enrollment.[7]

Effective Practices and Key Implementation Considerations

Effective practices for the tools that provide information and support regarding financial aid are similar to those for the planning and monitoring tools described above:

- **Provide clear Information early on,** as many are not aware of their options for financial aid and thus do not think they can afford college
- **Accompany information with assistance,** such as providing support to complete the FAFSA
- **Pair financial aid and educational planning tools** so that students have a single sign-on or access point

Electronic Transcripts

The electronic transmission of transcript information—from high schools to colleges and from two-year colleges to four-year colleges—is touted as a more efficient, timely, and accurate process than traditional paper transcripts or self-reported information. While there is evidence that electronic transcripts can ultimately lead to efficiencies by creating less burden on students and staff at high schools and colleges, it is not clear that this has a direct impact on the number of students who apply to college or their success once they enroll.

Many states contract with third-party providers to transmit high school and college transcripts electronically. In recent years, a movement has grown to expand this electronic exchange to include non-traditional learning elements such as credentials, badges, and documentation on skills and competencies. Advocates of this approach argue that alternative digital credentials or interoperable learning records allow for a more complete repository of information on an individual's skills and accomplishments, with flexibility to include information from multiple providers in one spot (ICDE, 2019;

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7 For more information, see https://www.cfnc.org/index.jsp

American Workforce Policy Advisory Board, 2019). This is particularly important for nontraditional and adult learners who may have longer and more episodic transitions in and out of education and training (Lemoie & Soares, 2020). Recent research from the American Council on Education explored the potential of blockchain technology to document and share data on individual learning, as one way to address the lack of a common format for nontraditional learning artifacts. The report argues that, in the current economic environment, it will be important to leverage technology to document, verify, and share data on knowledge and skills (Lemoie & Soares, 2020). Another argument for adopting more flexible technology solutions is that it is more student-centered, particularly if the tools allow individuals greater control over their own records (Connecting Credentials, 2016; Lemoie & Soares, 2020; American Workforce Policy Advisory Board, 2019).

Whether looking at the electronic transmission of traditional academic transcripts or the broader vision for a digital locker of skills and credentials, it is critical to address the issue of underlying data quality. For example, recent studies in California found discrepancies between California Department of Education (CDE) CALPADS data, university admissions data, and student transcripts regarding whether courses met the a-g requirements for eligibility at California State University (CSU) and the University of California (UC) (Fong et al., 2018; Gao et al., 2019).[8] Discrepancies may stem, in part, from the fact that local education agencies (LEAs) use disparate student information systems to populate CALPADS, which may not have the capacity to code courses as precisely as necessary. Understanding and mitigating this type of data quality issue is critical in the scaling of electronic transcript efforts and ensuring that students have an accurate understanding of whether they are on target for their college goals.

Tools: Examples from the States

The **Indiana** e-Transcript Initiative was developed in 2005 as a partnership between the Indiana Commission for Higher Education (ICHE) and the Indiana Department of Education (IDOE). A law passed by the Indiana General Assembly in 2013 enshrined the effort in statute and called for a common high school transcript to be developed by the IDOE in collaboration with ICHE. ICHE contracts with Parchment, Inc. to provide this service, with ongoing funding provided by the state. Indiana was the first state in the

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8 In addition to studies by independent researchers, CCGI found that approximately 25% of courses that its partner districts designated as meeting a-g requirements were not accurately registered with the University of California's A-G Course Management Portal.

Midwest to adopt e-transcripts and now at least six other states in the region have followed their lead.[9]

The Electronic Transcript Exchange, sponsored by the **Tennessee** Higher Education Commission (THEC), is available for use in all 129 high school districts and 432 public high schools in the state, as well as all Tennessee higher education institutions. The Tennessee Student Assistance Corporation (TSAC) also provides data through the exchange, which uses the National Student Clearinghouse as its vendor. Counselors submit transcript data to the exchange and then transcripts are sent either between high schools, to specified institutions of higher education, or to the Tennessee Lottery Scholarship for eligibility determination. Transcripts are saved in the exchange, allowing students to request copies after graduation. According to the exchange website, "transcript exchange is compliant with FERPA and works with the State of Tennessee to ensure that all data systems are compatible."[10]

Michigan's Center for Educational Performance and Information (CEPI) contracts with Parchment to deliver the state's e-transcript initiative, which allows for the electronic exchange of transcripts between the state's school districts, colleges, and universities. CEPI notes the following benefits of the exchange:[11]

- Students can send transcript at any time
- Faster delivery
- More efficient – less time involved on recipient side to process transcript
- Standard appearance makes transcript more legible
- Allows for data analysis for authorized users
- Every sending and receiving institution is authenticated by Parchment, and all transmissions between them are carried over secure channels. Parchment employs the same Secure Socket Layer (SSL) technology that powers today's online banking solutions.
- Parchment deletes transcript once confirming successful delivery

In **Texas**, efforts are underway to scale an initiative that started in the Dallas Community College District (DCCD) to allow students to have greater access to their own records. DCCD worked with Greenlight to develop a data structure that would allow multiple

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9 For more information, see https://www.in.gov/che/4626.htm

10 For more information, see https://studentclearinghouse.info/tn/

11 For more information, see https://www.michigan.gov/cepi/0,4546,7-113-54112---,00.html

institutions to write to the same student record. This digital record then allows a student who moves between institutions—whether K–12 or higher education—to have one record that they can access. For schools that are part of the Greenlight system, the company conducts a system integration with the local student information system, which allows records to be updated twice a day. Transcripts are kept in individual digital lockers. Students, or a parent if they are minors, give consent for information to go into this locker under FERPA. The locker is designed to be a lifelong learning tool that includes transcripts, certificates, badges, and letters of recommendation. Greenlight is also working with employers to include a job/skill matching tool through the system. The Texas Education Agency is now expanding on this effort and has provided support for all Texas high school seniors to have a Greenlight account. This investment was a response to concerns that, during the COVID-19 shutdown, students may have been taking classes in different ways and through different providers.[12]

Effective Practices and Key Implementation Considerations

The use of electronic transcripts, and in particular the inclusion of accomplishments such as credentials and badges, is a relatively new and evolving arena. Research in this area, as well as the experience of states who have tried to scale e-transcripts, suggests several considerations for statewide implementation:

- Determine **which vendor** can best meet the needs of the state in terms of security concerns and efficiencies
- Ensure **privacy concerns** are addressed
- Determine how to handle **common formats**—while some states require incoming transcripts to be in a common format, others put transcripts into a common format once uploaded
- Determine whether transcript records will be **kept or deleted** once submitted, based on whether California intends for students to maintain access to their records or if the transcript will be maintained only by the education institution
- Address issues of **underlying data quality** and common standards

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12 Information on Greenlight and Dallas Community College District (DCCD) obtained from conversations with Joseph May, Chancellor of DCCD on June 9, 2020 and with Manoj Kutty of Greenlight on June 10, 2020.

Assessment of Proposed Tools

For this background paper, WestEd researchers reviewed background information on CCGI and eTranscript California and conducted interviews with representatives of the two initiatives. We did not conduct an evaluation of the initiatives, but rather tried to provide a deeper understanding of what the tools offer. In this overview, we examine the potential of the tools to address the goals established by the workgroup, the extent to which the tools incorporate effective practices identified in the literature, provide some initial estimates of the cost, and outline steps for scaling each initiative.

Operational Tools Assessment: California College Guidance Initiative

The California College Guidance Initiative (CCGI) includes four components that the workgroup has identified as important for the state data system: a college and career planning tool, a mechanism for monitoring student progress towards college eligibility, a focus on improving data quality, and a platform for streamlining the application process for students to apply to college and for financial aid, while providing postsecondary institutions with electronic transcript data. CCGI's stated goals are to ensure that high school students in California graduate with clear postsecondary goals and a plan for how to achieve them; and that data follows students across educational systems to inform key decisions about admissions, placement, guidance, financial aid, and supportive services.

College and Career Planning Tool

A central component of CCGI is the college and career planning curriculum, available to students in grades 6 through 12. All students in California have free access to this planning curriculum through CaliforniaColleges.edu. Currently, almost 110,000 students enrolled in grades 6–8 and 253,000 students enrolled in grades 9–12 have active accounts on CaliforniaColleges.edu. Additional features (highlighted below) are available to partner districts. Some partner districts pay to receive additional services, while those in the Central Valley and Inland Empire are subsidized—initially by the California Community Colleges Chancellor's Office and currently by the California State University Office of the Chancellor—as part of College Next zones.

The college and career planning curriculum is designed to help students understand career options and the education and training required to enter those careers. The planning tool is designed to reach students early—beginning in sixth grade—and to provide touch points three to six times each year. Students' frequency of use is intended to increase in high school, particularly in grade 11 as they begin to focus on college options. The curriculum is designed to be used in classroom settings, guided by a counselor who can adapt and emphasize different aspects based on student needs. Students can also access the tool independently through a phone or mobile device, but CCGI data indicates that most of the usage is during instructional time.

CCGI does not track how often a student logs in. Instead, engagement is tracked based on whether students complete certain activities like saving a college to a college list, or launching a financial aid application. CCGI is in the process of looking at the evaluative data they have collected, including tracking student utilization in the context of district implementation plans. Staff believe the tool would be more effective if students logged in more often and are exploring how a college and career planning elective in grade 9 could be used to ensure early and consistent utilization of CaliforniaColleges.edu.

CCGI also includes a financial aid curriculum, which provides general information on financial aid opportunities and the cost of college. It is also intended to familiarize students and their parents with requirements for financial aid applications. The financial aid curriculum is designed to be introduced to students in grade 9. This module is currently being redesigned to facilitate the completion and tracking of financial aid lessons and to meet the requirements of state legislation (AB 2015) that specifies the information that needs to be provided to students prior to their senior year. They expect to release the revised financial aid section of the platform in fall 2021. However, if partner districts do not develop clear implementation plans that prioritize the financial aid modules, CCGI staff indicate that students may only get brief exposure to this information.

Monitoring Student Progress

A key component of the planning tool is the ability for students and their counselors in partner districts to see individuals' progress towards meeting CSU and UC eligibility requirements in real time. Counselors can run reports to show which students are on track to meet requirements and identify those who may need a course in a particular a-g subject area in order to attain baseline eligibility. They can then use this information

to guide their advising and ensure students take the courses that maximize their postsecondary options. CCGI staff acknowledge that utilization of this tool is varied, even though a-g completion rates are part of the CDE's College/Career Readiness Indicator. CCGI staff have found that utilization depends on factors such as the priorities of district leadership, the knowledge and workload of the counselors, and the culture of the institution.

Data Quality

In addition to allowing counselors to monitor student progress early on, LEAs can use the progress reports to see if there are problems with the data in their student information systems. When CCGI first begins working with a partner district, they run reports to determine whether courses in the local student information system are aligned with how coursework is reflected in the UC course management portal (CMP). This process allows LEAs to identify courses that they tell students meet the a-g requirements but are not currently listed in the CMP in a way that college admissions officers can identify. Often this discrepancy is due to something simple like a difference in course titles or course abbreviations. Rectifying this issue is important for ensuring that students know whether the courses they are taking count toward the CSU and UC eligibility requirements and so that they receive credit for the a-g coursework they have completed when they apply to four-year colleges. Ideally, partner districts use this tool to identify problems with their data and recode their courses in the CMP so that coursework can be identified and properly credited by admissions staff at the point of application. In addition, CCGI provides postsecondary institutions with students' K–12 identifier (SSID), which can aid in matching student records for multiple purposes, including for research projects or the Cradle-to-Career Data System.[13]

Application Launch and Electronic Transcripts

A third feature of CCGI is the ability for students in partner districts to launch their CCC, CSU, FAFSA, and Dream Act applications directly from CaliforniaColleges.edu. In 2019–20, more than 35,000 CCC applications, 28,700 CSU applications, and 15,700 FAFSA/Dream Act applications were launched through CaliforniaColleges.edu (CCGI is currently developing an integration with the UC Application that will go live in fall 2020).

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13 CCGI transmits SSID to CCCs, CSUs, and CSAC. UC has elected to not receive SSID from CCGI in phase one of the data system.

The ability to launch applications and move transcript data at the point of application helps to create efficiencies for students, LEAs, and higher education institutions:

- For **students,** the application process is simplified because they have a single point of access for CCC, CSU, UC, and financial aid applications, making it easier to keep track of which applications they have completed using one set of log-in credentials. In addition, for CCC and CSU applications, students do not have to manually enter their courses and grades, which saves time in the application process.
- For **partner districts,** counselors can more easily monitor where students are applying and access information that supports interventions when students need support in completing their applications
- For institutions of **higher education,** electronic transcripts help to eliminate human error in the application process, streamlining coursework verification and creating efficiencies for admissions staff so they can determine eligibility more quickly and accurately

The transfer of electronic transcripts also has the potential to help in the placement processes used by the CCC and CSU systems. For the CCC system, CCGI has provided 120,000 transcripts to the Multiple Measures Placement Service, which generates recommendations regarding first-year math and English courses based on high school course-taking patterns and GPAs. While some community colleges have elected to use local placement mechanisms for course guidance, such as self-reported grades, CCGI provides information that can help colleges comply with AB705, a law that requires community colleges to use high school coursework, high school grades, and high school grade point averages to recommend whether students should receive support in English and math courses.[14] For CSU, electronic transcripts provide earlier and more accurate information on student grades and course taking, which is needed to determine student placement in entry-level math and written communication courses.

CCGI transmits information to CCC and CSU using an application program interface (API) and to UC and CSAC through a secure file transfer protocol (sFTP), based on the preferences of the receiving institutions.

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14 For more information on AB705, see https://assessment.cccco.edu/ab-705-implementation

Student Support Eligibility

While CCGI does not currently include information on students' prior receipt of social services that could inform eligibility for supports in college, such as additional financial aid, food, housing, or medical care, the platform could be adapted to do so. Currently, each time students launch an application through the platform, they are asked to provide their consent to share their SSID and transcript. This consent form could be adapted to include requests to share eligibility information.

Adult Learners

The CCGI curriculum is designed for use in K–12 school districts with middle and high school students. This means it may be less useful for adult education, skills training, or those entering college after being in the workforce for some time.

Transfer Planning

While CCGI is designed to help students plan for higher education generally and provides information on California Community College (CCC) certificates and degrees in addition to four-year degrees, there is no course-level planning tool for transfer pathways. However, the CCGI curriculum does include content about transfer and the CaliforniaColleges.edu search tool provides information on Associate Degrees for Transfer.

Efforts to develop transfer planners for California community colleges have been stymied by inconsistencies in curriculum data that originate from multiple sources, as well as the diversity of transfer requirements. Most recently, data quality issues have slowed the implementation of the Program Pathway Mapper. Developed at Bakersfield College, this online tool creates a visual representation of individual college catalogs so that students can determine which classes to take to complete a program of study and prepare for transfer. As a first step in implementation, a report is produced that compares the major requirements shown in the print catalog with the Chancellor's Office Curriculum Inventory. College personnel are then tasked with determining which data source is correct for each major. Furthermore, for associate degrees that are not Associate Degrees for Transfer—such as many STEM degrees—the Program Pathway Mapper has to create multiple versions of transfer requirements to address differences

between CSU and UC, and among various campuses within the CSU and UC systems.[15] A transfer planner would be a valuable addition to CCGI's college and career planning tool, but it will first require college-level efforts to accurately document community college award and transfer requirements.

Comparison to Other States and Effective Practices

The design and intent of CCGI aligns closely with effective practices for several reasons. For example, it aims to provide early and frequent exposure to information on college and career, financial aid, and college affordability. The tools are designed to provide students and counselors with individualized information on progress related to student goals and milestones, enabling counselors to target guidance and interventions as in the example from Hawai'i. Students can launch both their college and financial aid applications through CaliforniaColleges.edu, however, the tool might be more effective if paired with access to specific financial aid counseling, as in the North Carolina example, and direct assistance with completing financial aid applications. The state could consider having other college and financial aid planning programs leverage the CaliforniaColleges.edu infrastructure to maximize impact and ensure consistent reporting capabilities.

An important caution in the literature is that planning, monitoring, and application tools are only as effective as the capacity of the institutions to implement them. CCGI implementation at the local level is varied and not all schools or counselors use the tools to their full potential. CCGI has attempted to address this challenge by integrating capacity building into its model and working closely with some partner districts to implement the tools. For example, CCGI staff encourage partner districts to set up cross-functional teams that include a district lead as well as guidance and career education counselors, principals, assistant principals, data experts, instructional leaders, and those who oversee specific services for English language learners and foster youth. CCGI works with that team to set targets for integration of the tools, review data on progress towards those targets throughout the year, and to adjust implementation strategies using a continuous improvement approach.

CCGI staff also work with district leaders to identify how the data generated from the tool can be helpful to LEAs, whether in terms of their College/Career Readiness

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15 For information on the Bakersfield College Pathway Mapper, see
https://www.bakersfieldcollege.edu/president/this-is-bakersfield-college-program-pathways-mapper

Indicator or other metrics. This approach is aligned with best practices of communicating how tools can support broader institutional and system goals. Currently, CCGI is generating reports designed to help district leadership look at the different utilization patterns at high schools within their districts to ensure that district leadership understand which students are receiving which supports and exposure to college and career planning.

CCGI also provides coaching to help with scaling the use of planning and application tools. For example, staff provide technical support around data cleanliness and quality issues. However, CCGI staff have found that, in many districts, no one person has the authority to correct errors in the data. Therefore, CCGI works with the district lead to help them figure out who needs to be at the table to make decisions, convene that group, and facilitate a decision-making process. While CCGI can provide information on data quality and automate the process of checking local information against the CMP, it cannot create the culture necessary for full utilization. Nor can data cleanup happen in isolation. Student mobility requires all districts to work on data quality for any given district to have accurate student records. CCGI staff note that without a policy framework that prioritizes the importance of clean data and requires all districts to properly align courses with the CMP, it is impossible to have eligibility tools that are completely accurate.

Without a universal system, such as the ones adopted by other states that have invested in a single college planning or electronic transcript tool for all education institutions, CCGI will be less successful at reducing equity gaps and increasing college-going rates. Furthermore, students will only experience the full benefit of the CCGI tools if districts improve data accuracy, align the tools with their local district policies and priorities, develop clear implementation plans, and encourage students to use the tools by integrating them into instructional time or required college and career planning workshops. Students transfer frequently between schools and districts, which means that if each LEA has its own college planning tool, students may need to recreate their college and career plans or contend with new technology after a move. Because highly mobile populations are often the most vulnerable and benefit from a consistent set of resources to support college and career readiness, a universal system is central to ensuring equity.

Scenarios for Scaling Existing CCGI Services

Currently, CCGI operates under the fiscal and legal governance of the Foundation for California Community Colleges, with an advisory board providing policy and strategy direction specifically for CCGI. As such, it could be fairly straightforward to transition to the Cradle-to-Career managing entity.

CCGI has demonstrated the ability to scale its services, starting with about 30,000 students in the San Gabriel Valley in 2013–14 to an estimated 630,000 this coming fall, representing a fifth of students in the state.

If implemented on a broader scale, with a policy framework to support widespread adoption, CCGI has the potential to provide students and families with more information and support to guide their college and career planning process and make it easier to apply for college and financial aid, while also providing colleges and CSAC with data that can help create efficiencies and improve the accuracy of key decisions about admissions, placement, financial aid, and supportive services. CCGI staff note that the timelines, sequencing, and cost of scaling this work are all variable, depending on what the state wants to achieve with its data system. The proposed stages and timing below are based on what CCGI staff believe would be an optimal fully scaled model, which would include the following:

- All K–12 districts would:
    - Clean up discrepancies in a-g coursework to align with the CMP
    - Provide students with an account on CaliforniaColleges.edu
    - Facilitate the use of CaliforniaColleges.edu as the launching point for all integrated applications for college and financial aid
    - Ensure transcript and other data flows directly from CDE to the receiving systems
    - Prioritize and demonstrate completion of a college and career planning curriculum for all students
- CCC, CSU, and the California Student Aid Commission (CSAC) would:
    - Use the student and course data flowing from CaliforniaColleges.edu to inform decisions about admissions, placement, guidance, financial aid, and support services

The scaled model would require that CCGI gather transcript data from CALPADS rather than through its current model—execution of agreements with and data uploads from each LEA. CALPADS is already working on developing the capacity to capture

transcript data from LEAs more frequently, and CCGI would only need data to be updated four times a year to streamline applications, advising, and data quality checks.

CCGI proposes a three-step process for bringing its services up to scale so that it can support most students in California:[16]

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16 The UC Office of the President has requested to be included in a later project phase.

Estimated Timeframe and Costs to Scale CCGI Statewide[17]

Timeframe	Activities	Estimated Cost
July 2021– June 2022	**Implementation:** Continue with current model, including state support for 12 existing College Next counties and availability of the planning tool for all LEAs	$2.2 million
	Technology development: Develop scripts that enable CCGI to consume data directly from CALPADS to make data-informed accounts on CaliforniaColleges.edu universally available to all public school students Integrate key eligibility indicators and mechanism for student consent to share data that identifies whether they are first-generation college-going, foster youth, homeless, migrant, or economically disadvantaged into all applications launched from CaliforniaColleges.edu Expand data fields exchanged with CSAC and move towards a nightly API exchange Pre-populate applications to all public higher education segments with required fields (such as SSID, transcript data on courses, and demographic information) to streamline the process for students and realize operational efficiencies for institutions	$800,000

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17 These figures assume that CCGI will receive the $2.5 million budget augmentation from the January 2020 budget for fiscal year 2021.

Timeframe	Activities	Estimated Cost
July 2022– June 2023	**Implementation:** Begin expansion of partner districts: Convert all CCGI partner districts currently paying for services to subsidized status Create an opt-in process for new LEAs, prioritizing those receiving Local Control Funding Formula concentration factor funding (LCFF+) and that commit to do data cleanup work and launch college and financial aid applications from within CaliforniaColleges.edu. Focus on reconciling data discrepancies and development of maintenance routines. Once data cleanup is complete, LEAs would be moved to production and all students provided full partner accounts.	$4.5 million
	Technology Development: Contingent on clean and sustainable data sets, this phase would focus on technology development and integration of: CTE pathways tools Apprenticeship search tools Transfer-related tools Regionalized labor market information mapped to educational programs	$1 million
July 2023 Forward	Phase three would begin to scale to all LEAs in the state, at a pace dictated by funding and state policy	TBD
Total		$8.5 million

These three steps do not include UC because the UC Office of the President has requested to be included in a later project phase. The scaling plan also does not include private or independent colleges because they use a wide range of application

platforms and the cost of scaling to the custom application form used by each individual college would be prohibitive. However, a link could potentially be made to the Common App in a future phase, if it is used by a critical mass of institutions.

The chart below shows estimated ongoing costs once CCGI is up to scale.

Estimated Annual Cost Per Component for Fully Scaled CCGI Model

Component	Description	Fully Scaled Cost/Year
College and Career Planning Tool	Includes technology, staffing, and operational costs, as well as user support and minimal (webinar/video-based) training on the use of the CCGI planning tools	$5.5 million/year if all accounts are linked to transcripts
Partnership Team Staffing	Technical assistance for data cleanup and implementation	$6.2 million/year
Infrastructure	Support for data storage, management, and security	$550,000/year
CSU/UC Eligibility Tools	Staffing/code maintenance and updates*	$500,000/year
Application Integrations		$500,000–$800,000/year
Additional Costs	Business operations, communications, leadership, measurement and learning, back office functions, staff development and training	TBD
Annual Total		$12.8 million–$13.1 million

*Assuming that data cleanup has occurred and that there is accurate transcript data in student accounts.

CCGI staff estimate that additional technology costs for LEAs should be negligible. Time and effort will be required, however, to reconcile discrepancies between how a-g courses are listed in local student information systems in comparison to CMP and will vary depending on district factors such as the number of school sites, baseline cleanliness of data, and current data literacy and capacity. This upfront effort is a one-

time cost, but LEAs will need to put in maintenance routines to ensure data quality over time.

For partner entities, there will be some development costs that will include adapting systems to consume and display new data fields such as student support eligibility information. In a future stage, costs would be more substantial for UC, independent, and private colleges because there is not currently a transfer of course data directly integrated from CaliforniaColleges.edu into those systems.

CCGI is designed to create efficiencies for students as well as partner institutions. CCGI staff believe that each augmentation can ultimately pay for itself if there is full participation by the educational segments because:

- The more data that flows to CSAC and higher education institutions, the more potential there is for operational savings in admissions and financial aid eligibility determinations. CSU estimates that, at scale, they could save $12–15 million in admissions processing for first-time freshman applicants.
- With universal adoption of a single planning platform, LEAs would no longer have to pay for contracts with private sector providers of planning tools

Operational Tools Assessment: eTranscript California

History and Current Implementation Status

eTranscript California, funded by the California Community Colleges Chancellor's Office (CCCCO) and managed by the California Community Colleges Technology Center (CCC Tech Center), facilitates electronic transcript request and delivery across California's postsecondary systems. Transcript files include:

- Learner identity information
- Institution information
- Degrees, certificates, and awards
- Course and grade history, including support for transfer credits
- GPA summaries

In the last year, 303,000 electronic transcripts were exchanged through eTranscript California, with about 2 million electronic transcripts exchanged through the network since it launched in 2008. The majority of activity represents transcripts delivered by participating CCCs to receiving CSU and UC campuses where students apply for

transfer admission. There are currently 103 institutions registered with the service, including 71 CCCs, 20 CSUs, 5 UCs, and 7 private colleges.

Transcripts are exchanged through the network in the California Electronic Transcript Standard, a data standard developed by the CCC Tech Center that facilitates data exchanges and ensures accuracy, with a focus on data areas unique to California such as the Intersegmental General Education Transfer Curriculum (IGETC).

Education institutions sign an agreement to become a member of eTranscript California, enabling them to exchange transcripts with any other participating member.[18] Files are not stored on CCC Tech Center servers. Instead the system provides direct peer-to-peer connections between members, which helps to ensure that the most current and up-to-date information is shared. In addition to routing transcripts to colleges, eTranscript California tracks which entities request and receive files.

Information is exchanged based on several scenarios:

- **Automated workflow for member institution:** if the system finds no hold for the record, transcript data is securely returned to eTranscript California and delivered to the requesting institution
- **Manual workflow for member institution:** once manually reviewed, transcript data is uploaded to eTranscript California and delivered to the requesting institution
- **External request such as a vendor transcript portal:** the college initiates the upload of a transcript to eTranscript California, which delivers it to the requesting institution

For receiving institutions, required IT resources are minimal if the institution wishes to access PDF and HTML transcripts from the online portal. With additional IT resources, receiving institutions can receive EDI and XML data files and load transcript data directly into their student information system.

Receiving institutions pay a fee to participate, however, underwriting from CCCCO allows community colleges to participate for free. The CCC Tech Center provides technical support to the colleges through account managers and documentation. For example, CCC Tech Center staff provide source code from existing members to

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18 View the eTranscript California legal agreement at https://etranscriptca.org/file-repository/category/2-contracts-agreements

expedite implementation for new members that use similar technologies. Implementation time varies depending on the institution's enterprise resource planning (ERP) system and the availability and strength of technical resources on campus.

Proposed eTranscript California 2.0

As part of the Cradle-to-Career Data System, the CCC Tech Center would implement four key technical upgrades to create eTranscript 2.0:

- leverage SuperGlue to modernize the underlying technology structure for community colleges
- integrate with EdExchange to improve the consistency and security of e-transcripts
- include nontraditional learning records like badges and certifications
- allow students to share data about prior receipt of social services, to confirm eligibility for additional supports when in college

SuperGlue is an integration architecture and data exchange model developed by the CCC Tech Center that allows disparate ERP systems at individual community colleges to connect in a standardized way to systemwide technologies. Upgrading would provide infrastructure that would make it easier and more efficient to connect to EdExchange. The CCC Tech Center would work with colleges to complete this upgrade with little work required by college IT professionals.

EdExchange is a national, open source exchange platform for data and digital documents. The platform was originally proposed by the CCC Tech Center to address issues experienced by many postsecondary institutions, including lack of data interoperability and the use of outdated technologies that lack current best practices for security. EdExchange represents two innovations:

- A set of **national standards,** developed by the Postsecondary Electronic Standards Council (PESC), that define how documents are packaged for exchange
- A web services model that **securely transmits files in real time** directly between institutions

PESC operates the network and is responsible for authenticating the colleges and vendors that connect to it, while the system is overseen by a technical workgroup and governance council. The network is a new venture that is currently implementing

several pilot projects that are funded by T3 Innovation Network grants from the U.S. Chamber of Commerce Foundation. EdExchange is compatible with CCGI, which already uses the PESC standards to move course and grade information for high school students to the CCC Tech Center.

The traditional transcript model is between institutions and does not require students to be involved. EdExchange uses a modern API-based security infrastructure that makes it possible for individuals to give their consent to share specific types of data. Therefore, eTranscript California 2.0 would enable students who are applying to college for the first time, or who are transferring between postsecondary institutions, to share information about services they have received from the California Department of Social Services (CDSS), including confirming their participation in CalWORKs, CalFresh, or MediCal, and if they are a foster youth. If students authorize information to be shared, CDSS would provide information that could be used to qualify students for services such as additional financial aid, food, housing, and health care supports.

In addition, the proposed upgrade of eTranscript California would allow for the exchange of a variety of data and document types such as e-portfolios, certifications, badges, job skills, competency-based education credits, co-curricular/experiential transcripts, and other evidence of learning.

Finally, eTranscript California would expand its user support infrastructure, so that students as well as colleges can receive assistance. The CCC Tech Center has an internal support team that provides phone and email-based support to students for several community college tools. The call center currently services thousands of support requests per month and could expand this support for e-transcript service questions from students.

Benefits to Students and Partner Entities

With the traditional paper-based approach, students may experience lengthy delays in submitting their transcripts due to the amount of time it takes to process the request. Furthermore, incomplete or inaccurate transcripts require follow-up and additional cycles of review. These delays and errors have equity implications. Requests for transfer admission are often processed using a first-come, first-served approach among qualified students, which can create inequitable outcomes for students who struggle to provide transcript information. When transcripts are delivered electronically, the

processing time is much quicker and the data is more accurate, which can lead to expedited admissions and articulation decisions and address equity gaps.

For education institutions, eTranscript California provides efficiencies in productivity, accuracy, and usability of transcript data by providing information in a reliable, electronic format. Transcripts can be received immediately upon request, significantly shortening admissions procedures. UC Riverside reports that eTranscript California turned a 16-day paper-based process into a one-day process. Cal State Northridge reports a bigger reduction in processing time: from 6 to 8 weeks to a single day. Sacramento City College reports that staff are able to respond to 1,600 transcript requests in 10 minutes. However, some colleges charge students for transcripts and would have to forgo that revenue if eTranscript California is provided for their students.

Another way that eTranscript California could support both students and colleges is by providing more complete information about students' basic needs. As colleges seek to address the total cost of college and rising food and housing insecurity, admissions packages could include information about social services that students can receive while in college and counselors could be alerted to facilitate case management that would better support students.

Finally, eTranscript California's ability to transmit nontraditional learning records may be particularly beneficial as postsecondary institutions seek to help workers retrain for new jobs in the aftermath of the COVID-19 pandemic and to provide more personalized education pathways through competency-based approaches.

Comparison to Other States and Effective Practices

eTranscript California follows some identified effective practices, most notably the establishment and use of a data standard for participating entities in a manner that addresses data needs specific to the state of California. The use of a common data structure provides consistency and improves accuracy, as evidenced in the state examples provided above. However, eTranscript California's requirement that transcripts conform to a common standard may increase the amount of effort for colleges to participate, compared to solutions adopted in some other states that accept transcript data in its native format. Furthermore, because there are no checks

about the validity of information, such as cross-referencing against ASSIST[19] to confirm that courses fulfill IGETC or CSU-Breadth requirements, errors in local ERP systems will be passed on to the receiving institution.

The proposed upgrades of the system to EdExchange would better position eTranscript California to address evolving technical security standards while facilitating privacy requirements.

The introduction of new functionality also addresses recommendations by advocates and researchers to include nontraditional learning artifacts and allow students to access and control their learning records. However, eTranscript California does not allow students to access their records from a digital locker, as is the case in Tennessee, or enable multiple education providers to write records to a common system, as in Texas, which might provide additional value for students.

In its proposal to integrate with the Cradle-to-Career Data System, eTranscript California focuses solely on providing a technology architecture, which means it would not coordinate with college personnel to clarify the value of using the service, address issues of data quality, or inform students about the availability and benefits of the service. As noted in the literature review above, technology solutions are most effective when paired with outreach and case-making efforts, which means that colleges would need to take on the effort and costs of this work. This will lead to uneven implementation, which may exacerbate equity gaps, such that students who attend institutions with more resources or a greater focus on student supports are more likely to benefit from eTranscript California.

Scaling Scenarios

eTranscript California is currently governed by an intersegmental steering committee, with representation from many of the partner entities including CCCCO, CSU, UC, and private colleges (CDE has also been involved historically). AICCU, CDE, CDSS, the Bureau of Private Postsecondary Education, and the managing entity could be added to the steering committee to ensure that the project provides the expected functionality. Individual independent colleges would be able to sign agreements that would add them to the trading network.

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19 Articulation System Stimulating Interinstitutional Student Transfer (ASSIST) is the official transfer and articulation system for CCC, CSU, and UC.

Adopting eTranscript California as a tool for all postsecondary institutions in California would contribute to more equitable outcomes. Absent a statewide approach, colleges would need to be convinced to join the eTranscript California network on the grounds that doing so would create efficiencies on campus, reduce data issues, and strengthen processes among member institutions.

Therefore, eTranscript California proposes a four-step process for bringing its services up to scale to support most postsecondary[20] students in California.

Estimated Timeframe and Costs to Scale eTranscript California Statewide

Timeframe	Activities	Estimated Cost
July 2021– March 2022	Complete integration of EdExchange and SuperGlue to the eTranscript 2.0 platform	$807,000
April 2022– June 2023	Deploy to all CCCs, CSUs, CCGI, and CDSS	$750,000
Aug 2021– March 2022	eTranscript CA 2.0 Upgrades, including: Develop ordering service and permissions API Integrate support for nontraditional learning records Develop data dictionaries and models Develop business rules engine	
July 2023– June 2024	Roll out to all 85 independent and 80% of the 100 private colleges in California*	$3.4 million
Total		$6 million

* Because some private colleges are small, family-run businesses, we presume that not all would participate.

The costs incurred by LEAs, colleges, and state agencies would be indirect costs related to making staff available for training on using the system, which is estimated to be 1 to 2 days for 1 to 3 staff members per institution, as well as the cost of alerting students about the availability of electronic transcripts, transmission of nontraditional learning

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20 Under the proposed scenario, CCGI would provide transcripts for K–12 students applying to college. The UC Office of the President has requested to be included in a later project phase.

records, and confirmation of eligibility for students supports. Entities that wish to receive non-transcript data and documents would need to plan for IT time to support their particular requirements, such as connecting to their ERP.

The chart below provides estimated costs once eTranscript California is up to scale.

Estimated Annual Cost for Fully Scaled eTranscript California

Component	Description	Fully Scaled Cost/Year
Support	Technical assistance for implementation to students and colleges	$300,000
Infrastructure	Data storage, management, and security	$364,000
Management	Staffing costs for the ongoing maintenance and operation	$200,000
Annual Total		$864,000

eTranscript California staff note that federal grants could help cover implementation costs.

Conclusion

Taken together, CCGI and eTranscript California have the potential to address each of the goals set out by the Cradle-to-Career Workgroup for operational tools, including helping students be better informed about college and career options, simplifying college and financial aid application processes, fostering stronger wraparound services, and improving data quality. However, funding the technology alone and allowing for voluntary participation by education institutions is unlikely to yield the desired outcomes. Significant work on the ground is needed to ensure that there is not only the capacity to implement the tools, but the incentives to ensure that all students benefit from them. While both require an investment to scale, they present potential efficiency gains for students and for institutions, which ultimately could lead to savings elsewhere. More importantly, if implemented well, they could address structural inequities that are disproportionately experienced by low-income people of color.

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