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The Master Plan for Higher Education in California and State Workforce Needs

A REVIEW

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Executive Summary

Almost sixty years after its creation, the Master Plan for Higher Education in California occupies a mythic place in conceptions of Californian and American education. For many, it was an intelligent design of a higher education system predicated on distinct functions for each segment and a promise of universal access to higher education to all students who desired it.¹ For others, it was a compact to keep higher education affordable and tuition free for all Californians. For institutions of higher education, it was an opportunity for each segment to “focus on its own mission.”²

Many attribute the success of California’s higher education system today, including the reputation of California’s public universities both as centers of academic excellence and as “upward mobility machines,” to the original Master Plan.³

While the mythic stature of the Master Plan is well-deserved in many respects, the reality of its creation was much less bold and idealistic. According to the literature surrounding it, the Master Plan was a defensive response to a set of challenges that threatened to upend California higher education. Rather than establishing truly universal access to higher education, it sought to provide—and limit—college and university education to those with the “capacity and willingness to profit by college instruction.”⁴ According to Clark Kerr, a leading figure in its development, the Master Plan was “a desperate attempt to prepare for a tidal wave of students, to escape state legislative domination, and to contain escalating warfare among its separate segments.”⁵

In this respect, the Master Plan was wildly successful, presiding over a period of growth between 1960 and 1975 during which enrollment in public higher education more than quadrupled. The significant success of California public higher education today, which serves more than two million students, has its roots in the Master Plan’s foundation. Nearly sixty years later, however, it is clear that the demographic, socioeconomic and technological conditions during which the original Master Plan came of age no longer exist today. Now, there is growing anxiety that California’s system of higher education will not fully meet the educational needs of an increasingly diverse student population or the evolving economic

¹ The three segments of California public higher education are: the University of California, the California State University, and the California community colleges. The independent nonprofit sector is considered a fourth segment of California higher education.

² Kathy Reeve Bracco and Patrick M. Callan, *Competition and Collaboration in California Higher Education* (San Jose, CA: National Center for Public Policy and Higher Education, January 2002), p. 5. The original Master Plan divided the functions as follows: the University of California would distinguish itself through its academic research mission and award bachelor’s, master’s and doctoral degrees; the California State University would focus on liberal arts and sciences and award primarily bachelor’s and master’s degrees; the California community colleges would serve as broad access institutions, focused on lower division instruction in preparation for transfer to 4-year institutions, as well as offering developmental and vocational education.

³ David Leonhardt, “California’s Upward-Mobility Machine,” *The New York Times* (September 17, 2015).

⁴ Master Plan Survey Team, *A Master Plan for Higher Education in California, 1960-1975* (Sacramento, CA: California State Department of Education, 1960), p. 195.

⁵ Quoted in Patrick Callan, *California Higher Education, the Master Plan, and the Erosion of College Opportunity* (San Jose, CA: National Center for Public Policy and Higher Education, February 2009) p. 4.

needs of the state. The expected gap in degree, certificate and skills production, the lack of alignment with regional economies, the impending technological and economic transformations, the growing needs of adult learners—these are all challenges that go well beyond what the architects of the Master Plan ever contemplated, as well as beyond the system of higher education that was designed.

This report, “Review of the Master Plan for Higher Education in California and State Workforce Needs,” responds to supplemental reporting language contained in the 2017 Budget Act, which directed the Governor’s Office of Planning and Research (OPR) to “conduct a review of state policies developed under the Master Plan for Higher Education in California and future workforce needs. As part of this review, OPR shall identify cross-segmental strategies to increase higher education enrollment and completion, improve re-skilling opportunities for adults, and better align academic programs with regional workforce demands.” In addition to identifying cross-segmental strategies, this report seeks to summarize the policy conversations, both historical and current, surrounding the Master Plan and higher education in order to provide a foundation for further thinking about how California can meet the changing needs of its students and economy.

Several broad themes emerge from this review:

- First, it is unlikely that California’s system of higher education can meet the needs of today’s students and of tomorrow’s workforce within the parameters of the Master Plan, with three distinct missions for the three distinct segments, and eligibility pools assigned to each.⁶ Higher education experts observe that the solutions that worked so well in the 1960s—differentiating each segment’s mission and directing them towards distinct lanes of activity—now contribute to problems of community college student transfer, limit cooperation in efficient use of scarce resources and impede coordination among segments and institutions to meet regional workforce needs.
- Second, in order to create a more coherent system of postsecondary education for the 21st century, fulfill the promise of access for students and respond to changing workforce needs, the state and its institutions of higher education need to craft seams that knit segments and campuses more closely together. The Associate Degree for Transfer and partnerships between community colleges and 4-year campuses to encourage transfer are examples of such seams that can be constructed.
- Third, demographic, socioeconomic and labor market transformations have contributed to the changing face of higher education and who we consider to be students. In the 1960s, a college education was not a prerequisite for a middle-class income, and there was accordingly little concern that students who did not go to college or persist in their studies would be severely disadvantaged; manufacturing and professionals services accounted for roughly equal portions of the workforce (almost 20 percent), and 92 percent of California’s population was white. Since then, the wage premium for baccalaureate degree holders (over high school graduates) has grown to between 60-70 percent; manufacturing has shrunk to 6 percent of California’s workforce, while professional

⁶ The Master Plan recommended that the UC and CSU systems draw their freshmen classes from, respectively, the top 12.5 percent and top 33.3 percent of graduating public high school students. It designated the community colleges as open access institutions.

services now accounts for almost 42 percent; today, California's population is far more diverse, with no single ethnic group forming a majority.

Addressing the needs of California's current and future population and ensuring that Californians have viable and accessible pathways to meaningful degrees and credentials requires a more student-centered perspective than existed in the days of the Master Plan. Higher education leaders observe that it is inadequate to continue to ask, "are students ready for education?" They urge that it is instead necessary to ask, "are institutions of higher education ready for today's students?" Meeting student and workforce needs requires continued work to eliminate barriers to access and completion, to create coherent pathways to degrees and credentials and to provide support to students on those pathways.

- Fourth, technological and economic changes will have a profound impact on the world of work and on higher education. The former president of Harvard University, Derek Bok, describes today's technological revolutions as a "force more sweeping, more rapid, and more unpredictable than anything previously experienced by colleges and universities."⁷ Both automation and artificial intelligence are expected to be enormously disruptive forces in the foreseeable future, which necessitates a rethinking of our postsecondary educational system as one that can accommodate workers throughout their work and lifespans. A renewed focus on coordinating continuing education or lifelong education will be necessary.
- Fifth, although institutions of higher education are vital contributors to California's economy at multiple levels, they are often not well aligned to regional economies; instead, higher education and regional economies are "connected but conflicted."⁸ Meeting the needs of California's students and economy will require that institutions of higher education ensure that students are genuinely prepared for the world of work in the 21st century. Higher education experts encourage establishing coherent, regional frameworks for more fully aligning higher education with workforce needs and 21st century student career requirements. They also suggest creating additional connections between the education that colleges and universities provide and the career goals of their students and the needs of regional economies.
- Sixth, higher education researchers and experts emphasize that, in order to evaluate the effectiveness of strategies for increasing enrollment and completion, it is necessary to establish a comprehensive system of data collection to track the progress of students from K-12 through higher education and into the workforce. Such a system could help determine which strategies are most effective at creating pathways into higher education, evaluate the actual progress of students and help students understand salary and wage information related to various courses of study or programs.

⁷ Derek Bok, *The Struggle to Reform Our Colleges* (Princeton, NJ: Princeton University Press, 2017), pp. 92-3.

⁸ W. Richard Scott, Michael W. Kirst et al., *Higher Education and Silicon Valley: Connected But Conflicted* (Baltimore, MD: Johns Hopkins University Press, 2017).

- Seventh, higher education finance is of particular concern. Repeated boom and bust cycles since the 1990s have been cited as being particularly destructive. The estimated capital spending needed to replace aging physical infrastructure is considerable. Both these factors are seen as negatively affecting institutional capacity for enrollment and completion. Addressing challenges of higher education finance and establishing a stable foundation for future state funding may include consideration of ways to align higher education cost structures more fully with state educational priorities.
- Lastly, higher education researchers and stakeholders emphasize the importance of leadership and vision in responding to the challenges facing Californian higher education today. Many observe, however, that California currently lacks a clearly defined vision and structure for higher education to direct and organize reforms.

It is worth noting that since the creation of the Master Plan, numerous reviews and reports have examined its workings and identified weaknesses and shortcomings. Yet, despite the numerous recommendations they offered, the impact of these reviews on California higher education was generally minimal. In large part, this was because these reviews sought to change higher education outcomes while leaving the structures, mechanics and incentives of higher education unchanged. In contrast, the architects of the Master Plan reshaped the structures of California higher education by leveraging the institutional interests of the systems and individual campuses in an effort to avoid legislatively directed centralization. One lesson of half a century of Master Plan reviews is that effecting meaningful and lasting change in higher education will depend on altering the structures, mechanics and incentives of higher education; recognizing institutional and stakeholders' interests; and requiring the participation and cooperation of those institutions and their stakeholders.

I. Introduction

For half a century, the Master Plan for Higher Education in California has been the foundational document of California higher education. There is increasing concern, however, about the ability of California's system of higher education to meet the state's future workforce needs and the increasing demand for higher education. Numerous reports have identified looming degree and skills gaps. Under some projections for population growth and degree production, the percentage of California's working adult population with a bachelor's degree or higher will be essentially the same in 2030 as it is today, even as populations in other states and countries become more educated and demand for highly educated workers grows. Such projections coincide with widespread concern that looming technological innovations in fields of robotics and artificial intelligence may endanger millions of today's jobs, ranging from the low- to high-skilled. Other concerns revolve around continued access and affordability, as California's population has grown more diverse.

Supplemental reporting language contained in the Budget Act of 2017 directed the Governor's Office of Planning and Research to review state policies developed under the Master Plan for Higher Education in California and the state's future workforce needs, and to identify cross-segmental strategies to: 1) increase higher education enrollment and completion; 2) improve re-skilling opportunities for adults; and 3) better align higher education and regional economies. This report is the product of that review process, which included roundtable conversations with higher education stakeholders, interviews with faculty, administrators and higher education experts, and a comprehensive survey of academic and policy literature surrounding the Master Plan for Higher Education and California's current needs for postsecondary education.

In addition to identifying the cross-segmental strategies noted above, this report also aims to provide a broader perspective on the Master Plan in order to inform and encourage future policy discussions on California higher education. Finally, because of the perennial debate that exists as to whether the structures and principles of the Master Plan can meet the changing needs of California's students and economy, this report summarizes the state of conversation surrounding the Master Plan and California higher education in order to inform answers to that question.

II. The Master Plan: A Historical and Retrospective Review

The reality of the Master Plan for Higher Education in California differs from popular imagination. It is broadly believed that the Master Plan constituted a promise of universal, affordable higher education to all students who desired it. In its more mundane reality, the Master Plan put forward a plan to enable California's system of higher education to confront rapidly increasing enrollments and overcome institutional competition. It focused on cost-containment as much as it did on expanding college access and restricted direct access to the public 4-year segments in order to restrain costs and, in the eyes of its architects, preserve institutional quality. It also focused on providing a traditional higher education to traditional students within a largely homogenous state population.

The Origins of the Master Plan

In the decades following its adoption, the 1960 Master Plan obtained a mythic stature in understandings of California higher education. In popular perception the Master Plan is a “biblical event,” a “divine creation by the savant of American higher education, Clark Kerr, who gave birth to the state’s tripartite structure” of community colleges, regionally based state universities and network of research universities.⁹ At the core of this creation story is the belief that Kerr, the president of the University of California, and his fellow Master Plan architects intended to provide universal accessibility to higher education as a mechanism to spur upward mobility. From this perspective the “Master Plan was nothing more than a blanket commitment from the state to educate all the California students who wanted an education and, in doing so, to facilitate the kind of class mobility that has placed public education at the center of American civic life.”¹⁰

The actual origins of the Master Plan were considerably less bold. The Master Plan did not create the segments of California higher education. Instead, according to the historian of California higher education, John Aubrey Douglass, it built on the state’s longstanding commitment to higher education and marked the synthesis of the “the California Idea” of higher education, a model that sought to link increasing accessibility with the creation of high quality colleges and universities.¹¹ Although the Master Plan now appears as a monument to central planning and educational organization, it was a defensive response to a set of challenges that threatened to upend California higher education. Moreover, rather than establishing truly universal access to higher education, it sought to make college and university available to those with the “capacity and willingness to profit by college instruction.”¹² Significantly, the understanding of “capacity” contained in the Master Plan was a restrictive one; the Master Plan did not provide a framework to translate access into successful transfer from the community colleges to 4-year institutions.

According to Kerr’s own recollections, the Master Plan was “a desperate attempt to prepare for a tidal wave of students, to escape state legislative domination, and to contain escalating warfare among its separate segments.”¹³ Total full time enrollment in California higher education in 1958 was 225,615. Projections estimated that by 1970 that number would grow to 661,350.¹⁴ This projected expansion in enrollment threatened to swamp the existing system of higher education. At the same time, a battle for dollars and institutional prestige raged. The state colleges sought to encroach on the University of California’s provinces of research and graduate training. Political pressure rather than student needs

⁹ John Aubrey Douglass, “From Chaos to Order and Back? A Revisionist Reflection on the California Master Plan for Higher Education@50 and Thoughts About its Future,” CSHE [Center for Studies in Higher Education] Research and Occasional Paper Series, CSHE.7.10 (May 2010), p. 3.

¹⁰ Aaron Bady and Mike Konczal, “From Master Plan to No Plan: The Slow Death of Public Higher Education,” *Dissent* (Fall 2012).

¹¹ John Aubrey Douglass, *The California Idea and American Higher Education: 1850 to the 1960 Master Plan* (Stanford, CA: Stanford University Press, 2000).

¹² Master Plan Survey Team, *A Master Plan for Higher Education in California, 1960-1975* (Sacramento, CA: California State Department of Education, 1960), p. 195.

¹³ Quoted in Patrick Callan, *California Higher Education, the Master Plan, and the Erosion of College Opportunity* (San Jose, CA: National Center for Public Policy and Higher Education, February 2009), p. 4.

¹⁴ *A Master Plan for Higher Education in California* (1960), p. 46.

threatened to determine the location of new facilities as lawmakers sought the construction of campuses in their own districts. In response to looming anarchy, Governor Pat Brown and other politicians threatened to bring the existing systems and campuses under control of a single state board.¹⁵ In the context of these challenges and threats, the Master Plan constituted a “political maneuver” to maintain peace among segments, retain university autonomy and sustain UC preeminence.¹⁶

In total, *A Master Plan for Higher Education in California, 1960-1975* put forward 67 recommendations for higher education in the state, “all designed to provide educational opportunity to qualified students at a minimum cost to the taxpayer.”¹⁷ The key elements of the plan are well documented:¹⁸

- The Master Plan delineated the responsibilities and defined the missions of the public segments of California Higher Education—the University of California, the California State Colleges (now the California State University) and the California Community College system:
 - The University of California would distinguish itself through its academic research mission and award bachelor’s, master’s and doctoral degrees.
 - The California State University would focus on liberal arts and sciences and award primarily bachelor’s and master’s degrees.
 - The California community colleges would serve as broad access institutions, focused on lower division instruction in preparation for transfer to 4-year institutions, as well as offering developmental and vocational education.
- It established eligibility pools from which the segments were to draw their respective students:
 - The plan designated community colleges as “open access” institutions.
 - It reduced the pool of students eligible for UC freshman admission from the top 15 percent of high school graduates to the top 12.5 percent. The eligibility pool for CSU freshman admission was reduced from the top 50 percent of high school graduates to the top 33.3 percent.
- It enshrined the transfer function as a primary feature of California higher education. By directing freshmen who were not eligible for the UC and CSU to community colleges, the Master Plan constrained costs in the face of increased enrollment. By offering community college students who completed their lower-division requirements the opportunity to transfer, it provided them with a pathway to a bachelor’s degree.

¹⁵ Douglass, *The California Idea*; Douglass, “From Chaos to Order and Back.”

¹⁶ California Competes, *Moving Past the Master Plan: Report on the California Master Plan for Higher Education* (Oakland, CA: 2017), p. 5.

¹⁷ *A Master Plan for Higher Education in California* (1960), p. xii.

¹⁸ The following summary of the Master Plan’s principal achievements draws from Douglass, “From Chaos to Order and Back;” Legislative Analyst’s Office [LAO], *The Master Plan at 50: Assessing California Vision for Higher Education* (Sacramento, CA: November 12, 2009); LAO, *Overview of Higher Education in California* (Sacramento, CA: August 31, 2017).

- The Master Plan established the Coordinating Council for Higher Education to plan and manage California’s system of postsecondary education and granted that body power to approve new campuses and graduate programs.

The architects of the Master Plan recommended against tuition charges for California residents. Their commitment to the tuition-free principle coincided, however, with the recommendation that students assume greater responsibility for financing their education through fees for non-instructional services. In light of present concern over the impact of cost of living on college affordability, it is notable that the Master Plan recommended that ancillary services, including housing and parking, should be entirely self-supporting.¹⁹ More broadly, the Plan sought to contain costs by diverting students from 4-year campuses to community colleges, where education was less costly and substantially supported by local property tax revenue. “In fact, a good case can be made that cost containment was a more important consideration than access for those who framed the Master Plan.”²⁰

What ultimately emerged out of the research and negotiations behind the Master Plan was a general agreement for the structure of an expanded system of California higher education that was shared among the segments of higher education and endorsed by the Legislature and Governor. Elements of the Master Plan were subsequently enacted in statute through the 1960 Donahoe Higher Education Act. Some aspects of the Plan, including the mission definitions of the segments, exist in statute. Other elements of the plan, including eligibility targets and recommendations regarding tuition levels, are not in statute but, to varying degrees, have shaped state and segmental higher education policies.

Reviews of the Master Plan

Since the creation of the original Master Plan, a series of reports and reviews have sought to assess its performance and to update it in response to apparent deficiencies and changing needs. Legislative committees have reviewed the Master Plan at roughly decennial intervals. The Legislative Analyst’s Office (LAO), Public Policy Institute of California (PPIC) and the Little Hoover Commission have produced reports dedicated to the Master Plan, as have educational research centers in California and nationwide. There is no agreement as to which of these reports are “official.”²¹ That said, the eight published reports that were the product of the Coordinating Council and of legislative committees provide insight into changing perspectives of policymakers and legislators toward the Master Plan and California higher education. These reviews have included numerous recommendations variously seeking to reaffirm, update, alter or reform aspects of Californian postsecondary education.²²

¹⁹ *A Master Plan for Higher Education in California* (1960), p. 173.

²⁰ Saul Geiser and Richard C. Atkinson, “Beyond the Master Plan: The Case for Restructuring Baccalaureate Education in California” *California Journal of Politics and Policy* 4, no 1 (January 2013): 67-123, at p. 4.

²¹ Compare the lists of Master Plan reports in LAO, *The Master Plan at 50: Assessing California’s Vision for Higher Education* and California Competes, *Moving Past the Master Plan*.

²² The 1966 Coordinating Council report reviewed the status of implementation of the Master Plan and did not include additional recommendations. This list of reviews does not include the major reports from the California Citizens Commission on Higher Education, *Toward A State of Learning: California Higher Education for the Twenty-First Century* (Los Angeles, CA: Center for Governmental Studies, 1999), and the Little Hoover Commission, *A New Plan for A New Economy: Reimagining Higher Education* (Sacramento, CA: October 2013).

The major Coordinating Council and legislative reports are as follows:

1960s

Coordinating Council for Higher Education, *The Master Plan Five Years Later* (1966)

- This initial report on the Master Plan provided an update on the implementation of the Master Plan's original recommendations.

1970s

Select Committee on the Master Plan for Higher Education to the Coordinating Council for Higher Education, *The California Master Plan for Higher Education in the Seventies and Beyond* (1972);

Joint Committee on the Master Plan for Higher Education, *Report of the Joint Committee on the Master Plan for Higher Education* (1973)

- The 1970s reports on the Master Plan sought to respond to new forces affecting higher education and "changing social attitudes and conditions." The 1972 review addressed changes in faculty governance, student demands to participate in higher education politics, the inability of financial support to keep up with growing enrollments and increasing concern for "disadvantaged young people." It supported in principle "universal access" to higher education and encouraged programs to ensure access to students of "all socio-economic levels."²³ The 1973 Joint Committee Report recommended that each segment seek to approximate by 1980 the "general ethnic, sexual and economic composition of the recent California high school graduates."
- Both reports identified coordination of the segments and institutions of higher education as a weak point of the Master Plan. The 1972 report recommended the transformation of the Coordinating Council into an expanded commission for higher education with greater planning functions. The 1973 Joint Committee identified the "most telling criticism of the California system" as "its fragmentation of responsibility which has led to a critical absence of statewide coordination, planning and policy development." The most enduring outcome of these initial reports was the replacement of the Coordinating Council with the California Postsecondary Education Commission (CPEC). Where the Coordinating Council had operated largely on the basis of passive coordination, CPEC was to provide for greater oversight. It contained a majority of public members, reduced segmental representation, had an expanded planning function and could require the segments to submit information.²⁴
- Both reports also emphasized the importance of regional intersegmental cooperation and the preservation of diversity within the segments. The 1972 review frowned on efforts to develop each UC campus on the model of the Berkeley and Los Angeles campuses and warned that the designation of the majority of state colleges as universities would tempt the other campuses to achieve the programmatic measurements necessary for that status.

²³ Select Committee on the Master Plan for Higher Education to the Coordinating Council for Higher Education, *The California Master Plan for Higher Education in the Seventies and Beyond* (Sacramento, CA: California State Department of Education, 1972), p. xi.

²⁴ LAO, *The Master Plan at 50: Greater Than the Sums of Its Parts – Coordinating Higher Education in California* (Sacramento, CA: January 2010), pp. 10-12.

1980s

Commission for the Review of the Master Plan for Higher Education, *The Challenge of Change: A Reassessment of the California Community College* (1986); Commission for the Review of the Master Plan for Higher Education, *The Master Plan Renewed: Unity, Equity, Quality, and Efficiency in California Postsecondary Education* (1987); Joint Committee for Review of the Master Plan for Higher Education, *California Faces...California's Future: Education for Citizenship in a Multicultural Democracy* (1989)

- The 1980s reviews broadly responded to the challenges of California's rapidly diversifying population.
- The 1989 Joint Committee report was the first to call comprehensively for a reframing of higher education in light of California's increasingly diverse and multiethnic population. It asked that "our universities and colleges share with us a deepening commitment to build the programs and realize the promises of a truly multicultural democracy." Like the 1973 report, this report set a goal of achieving higher education enrollments that approximated the "general ethnic, gender, economic, and regional composition of recent high school graduates," but now with an achievement date of 2000. The reports addressed the growing missions of the community colleges, the need to ensure that financial aid kept pace with enrollment growth and the importance of holding the segments responsible for retention and graduation rates. They also confirmed the transfer function as a priority for the segments.

1990s

Assembly Committee on Higher Education, *Master Plan for Higher Education in Focus [Draft Report]* (1993)

- This report responded to the severe challenges that confronted the institutions of higher education as a result of the recession of the early 1990s.²⁵ The review process ended prematurely and the report was never finalized.
- It was the first report to address Master Plan policies in light of deteriorating state fiscal conditions and addressed the declining student outcomes that emerged from budgetary crisis and institutional inflexibility: "[i]n place of the visionary covenant between California and its future is left a paralysis of depression and denial among students, educators, and public officials. The present state of access and quality has drifted so far from the Master Plan's objectives and values that California could have hardly done greater harm had it set out to do so."²⁶

2000s

Joint Committee to Develop a Master Plan for Education, *The California Master Plan for Education* (2002)

- This report was an enormously ambitious call for a new Master Plan for Education that would encompass pre-K through postsecondary education.

²⁵ The budgetary reductions of the 1990s are discussed more fully below in the section, "The Changing Social and Economic Landscape of California Higher Education."

²⁶ Assembly Committee on Higher Education, "Master Plan for Higher Education in Focus" [Draft Report] (April 1993), p. 3.

- This report proposed broader changes to the structure of the Master Plan than its predecessors. These recommendations included: reconstituting the CCC Board of Governors as a “public trust” comparable to the UC and CSU boards; authorizing the CCC to provide upper division instruction in collaboration with the other segments; and creating a California Education Commission that would, among other functions, coordinate articulation and outreach between high schools and higher education.
- It put forward a series of recommendations regarding student preparedness, including high school assessment, and collaboration between the UC, CSU and K-12 to reduce remediation.
- The report encouraged policies to reduce “boom and bust” cycles in higher education finance and recommended a shift from a “no or low fee system to a system of affordable fees.”

Joint Committee on the Master Plan for Higher Education, *Appreciating Our Past, Ensuring Our Future: A Public Agenda of Needs for Higher Education in California* (2010)

- The most recent review of the Master Plan was a shorter document than its predecessors and consisted of statements of principle as opposed to specific recommendations.
- This report asserted the need to develop a set of public policy goals for higher education “based upon the *outcomes* required to meet the needs of our state and our people.”
- It reaffirmed the state’s commitment to universal access for all qualified students.
- It also identified career technical education and a workforce development system as essential tools for meeting 21st century needs. In addition, it emphasized the need for a clearer and simpler system of articulation, based on a transfer associate degree.

These reviews broadly reaffirmed the basic components of the Master Plan. They all identified shortcomings of the original Master Plan and of California higher education with regard to access, equity, affordability, accountability and preparedness.²⁷ The 1973 Joint Committee Report even suggested that the “‘master plan’ concept is no longer useful.” The report observed that the concept implied “rigidity” which precluded the “flexibility necessary for adaptation to changing needs of students and society.”²⁸ It recommended a continuous planning process and decennial legislative reviews. There was, apart from this, generally little question of whether the basic framework of the Master Plan was suitable for the shifting goals for California higher education. Proposed solutions lay in affirming and revitalizing the basic structures and functions of the original plan, as when reviewers framed repeated proposals to enhance diversity and improve accessibility in response to California’s changing demographics as efforts to realize the goals of the Master Plan. The outcome and conclusions of these reports were thus well summarized when, in the context of the 2010 review, the Co-Chair of the Joint Committee on the Master Plan, Assemblymember Ira Ruskin, asserted, “The purpose, principles and structure of the Master Plan are sound. We need to recommit ourselves to its promise.”²⁹

²⁷ California Competes, *Moving Past the Master Plan*, p. 2.

²⁸ Joint Committee on the Master Plan for Higher Education, *Report of the Joint Committee on the Master Plan for Higher Education* (Sacramento, CA: California Legislature, 1973), pp. 20-1.

²⁹ Kim Kowsky, “Lawmakers: No Master Plan Makeover,” *UCLA Magazine* (April 1, 2010), (http://magazine.ucla.edu/features/master_plan_makeover/). Accessed 2-27-2018.

This regularly reaffirmed commitment to the Master Plan provides one explanation for the limited impact of this half century of Master Plan reviews. Efforts to address recognized limitations in California's system of higher education, as through the creation of CPEC, often failed to accomplish their intended aims. Goals recommended in the reviews, as for increasing diversity or improving transfer rates, have proved persistently difficult to achieve. In their recommendations for addressing weaknesses of California higher education, reviewers repeatedly sought different results from California's postsecondary institutions while leaving the general structures and policies of the Master Plan largely untouched. It is possible that reviewers' confidence in the principles of the Master Plan and their belief that its structures were sound helped to undermine their efforts to change the outcomes of higher education. Changing those outcomes may have required greater willingness to examine, question or alter elements of the Master Plan's principles and structures.

The inability of these reviews to effect significant change suggests another lesson, as well. The 1960 Master Plan was a product of negotiations and agreement among California's institutions of higher education. It was a political process that succeeded by leveraging the interests of those institutions and their common desire for preserved or enhanced autonomy in the face of threats of greater legislative and centralized control. The "top-down" legislative reviews that followed provided little such incentive for segments, institutions and stakeholders to alter their practices. One participant in earlier Master Plan reviews observed that recent segment-led and supported innovations in the community college system, including the creation of the Strong Workforce Program and introduction of the online community college campus, have effected more change than any of the past reviews. One question that policymakers may ask is, "how can the state better leverage institutional and segmental interests to produce necessary outcomes?"

The Successes of the Master Plan

Enduring confidence in the purpose, principles and structures of the Master Plan displayed in legislative reviews is understandable. The reputation of the Master Plan is, in many respects, well deserved. The Plan allowed California to meet expanding demand for higher education while maintaining and enhancing the reputation for excellence of the state's institutions of higher education. After 1960, California higher education expanded dramatically. Total full-time enrollment in the public higher education segments grew from 203,000 in 1960 to 1,786,000 in 2015. UC enrollment increased from 44,000 to 253,000 full-time equivalent (FTE) students between those years and the UC system expanded from 6 campuses to 10. CSU enrollment grew by more than a factor of six, from 61,000 to 395,000 FTE students, and the CSU system expanded from 16 campuses to 23. The community college system expanded by more than a factor of ten, from 98,000 to 1,138,000 FTE students, and from 64 campuses to 113.³⁰ The fastest period of enrollment and campus growth occurred between 1960 and 1970, when enrollment grew by 300 percent; enrollment in the public segments expanded from 227,000 FTE students in 1960 to more than 1 million FTE students in 1975.³¹

³⁰ LAO, *Overview of Higher Education in California*, p. 6.

³¹ Callan, *California Higher Education*, pp. 7-8; Douglass, *The California Idea*, p. 316.

The triumph of the Master Plan was to manage this rapid growth and to balance access and quality in higher education. The expansion of higher education in California after 1960 depended on substantial state support and funding that enabled the rapid growth of colleges and universities and created much of the existing physical infrastructure of California's public system of higher education. It was the Master Plan that ensured that expansion did not descend into turf battles. The Master Plan provided lanes that focused institutions on well-defined missions and substantially corralled the mission creep common to institutions of higher education in other states, which tended to distract colleges and universities from the populations they were originally intended to serve. "By sparing the Legislature and public the battles over turf that dominated the higher education landscape in other states, the Master Plan contributed to public confidence, which in turn brought state financial support to higher education."³² The Master Plan's role in defining and preserving segmental missions provides a key explanation for the status of UC campuses as leading national (and international) research institutions; the Master Plan also provided space for CSU campuses to develop as leading and highly respected comprehensive universities.

In addition to having reputations as centers of academic excellence, the UC and CSU campuses are "upward-mobility machines."³³ In 2015, the *New York Times* ranked colleges and universities with five-year graduation rates of 75 percent and higher based on their accessibility to low-income students—the top five schools were all UC campuses.³⁴ UC campuses feature, moreover, a far more socioeconomic diverse student body than most other highly regarded research universities, public or private. A subsequent *New York Times* report ranked colleges and universities based on the percentage of their students who came from the bottom quintile of income distribution and who then moved into the top three quintiles following their departure from higher education. Of the ten colleges and universities with the highest mobility rate, five were California public institutions of higher education: four CSU campuses and one UC campus.³⁵ Such studies illustrate that the Master Plan's promise of an accessible, high-quality system of higher education is real and endures for many students.

The Changing Social and Economic Landscape of California Higher Education

For all its enduring successes, the Master Plan was intended to organize California higher education in response to particular pressures, for the period 1960-1975. The Master Plan's longevity is a testament to the vision of its authors and their ability to negotiate a settlement among an array of institutions.

Significant demographic, economic and institutional changes, nevertheless, distinguish the California facing Kerr and his fellow architects of the Master Plan from the California of today. These changes have

³² Callan, *California Higher Education*, pp. 6, 20.

³³ David Leonhardt, "California's Upward-Mobility Machine," *The New York Times* (September 17, 2015).

³⁴ The Upshot, "Top Colleges Doing the Most for Low-Income Students," *The New York Times* (September 16, 2015), <https://www.nytimes.com/interactive/2015/09/17/upshot/top-colleges-doing-the-most-for-low-income-students.html>.

³⁵ David Leonhardt, "America's Great Working-Class Colleges," *The New York Times* (January 18, 2017). <https://www.nytimes.com/2017/01/18/opinion/sunday/americas-great-working-class-colleges.html>.

had a significant impact on California's segments of higher education and have revealed deficiencies in the ability of the structures of the Master Plan to address a changing higher education landscape.³⁶

California's economy and demographics shifted dramatically in the decades following the development of the Master Plan. In 1960, a college education was not a prerequisite for a middle-class income and there was accordingly little concern that students who did not go to college or persist in their studies would be severely disadvantaged. California's economy in 1960 was substantially more blue-collar than that which emerged over succeeding decades. In 1969, manufacturing and professional services accounted for approximately equal portions of the California workforce, 18.5 and 19.9 percent respectively. By 2016, manufacturing had shrunk to 6.1 percent of the workforce while professional services accounted for 41.6 percent.³⁷ As traditional blue-collar employment declined as a portion of the California economy, the wage premium for holders of bachelor's degrees over high school graduates grew. In 1979, the wage premium was 22.1 percent for California women and 21.8 percent for California men; in 2014, those figures were 70.1 percent and 60.2 percent, respectively.³⁸ Income inequality in California, meanwhile, has widened. Between 1960 and 2015, the share of income in California held by the top 1 percent of earners expanded from about 10 percent to almost 24 percent, while the percentage of households with children where all parents work grew from 34.2 percent to 57.3 percent between 1970 and 2014.³⁹

The state has also become substantially more ethnically heterogeneous. Whereas the California population in 1960 was 92 percent white, today the population is 37 percent white, 39 percent Latino, 16 percent Asian/Pacific Islander and 6.5 percent African-American.⁴⁰ A final illustration of the changing world lies in the growth of college enrollment of female students. In 1960, about 40 percent of students enrolled in the UC and state colleges were female; in fall 2017, female enrollment constituted 56 percent of the CSU undergraduate population and 52 percent of the UC undergraduate student body.⁴¹

This realization of the changing demographics and ecology of California higher education is documented in the many Master Plan reviews. The 1987 review of the Master Plan enumerated assumptions of the

³⁶ Joni E. Finney et al, *From Master Plan to Mediocrity: Higher Education Performance & Policy in California* (Philadelphia: Institute for Research on Higher Education, April 2014).

³⁷ Data from the Bureau of Economic Analysis, Regional Data.

³⁸ Luke Reidenbach, *How California's Workforce is Changing and Why State Policy Has to Change With It* (Sacramento, CA: California Budget & Policy Center, September 2015).

³⁹ The households where all parents work include single-parent and dual-income households, Reidenbach, *How California's Workforce is Changing*; Estelle Sommeiller and Mark Price, "Income Inequality in California," from *The New Gilded Age: Income Inequality in the U.S. by State, Metropolitan Area, and County* (Washington, D.C.: Economic Policy Institute, July 19, 2018). <https://www.epi.org/multimedia/unequal-states-of-america/#/California>. Accessed 12-19-2018.

⁴⁰ United States Census Bureau, Quick Facts—California (Estimates for July 2017), <https://www.census.gov/quickfacts/ca>. Accessed 8-27-2018.

⁴¹ California State University Office of the Chancellor, *Statistical Abstract to July 2009* (Long Beach, CA: California State University, 2010), p. 48, Table 41; CSU Institutional Research and Analyses, Statistical Reports 2017-2018, CSU Enrollment by Age, Sex, and Student Level, Fall 2017 Profile, http://www.calstate.edu/as/stat_reports/2017-2018/f_age17toc.shtml. Accessed 8-27-2018. UCOP Infocenter, Fall Enrollment at a Glance, <https://www.universityofcalifornia.edu/infocenter/fall-enrollment-glance>. Accessed 8-27-2018.

1960 Master Plan that were no longer current: in 1960, public primary and secondary education “was believed to function reasonably well” and student preparation was not perceived to be an issue for higher education; it was still assumed that college was for a population of ethnically homogenous, “financially able” and well-prepared 18-22 year olds; and the primary function of the community colleges was academic instruction for transfer.⁴² In a 1993 review of Master Plan policies, CPEC observed that the Master Plan focused on providing higher education to recent high school graduates who would enroll full time; diversity and equality of opportunity for historically underrepresented groups and the needs of older adults, immigrants and the unemployed had not factored into the planning process.⁴³

Reports also identified structural and systemic weaknesses that emerged or became apparent during the 1970s and 1980s. During these decades, the transfer function between the community colleges and 4-year institutions failed to function as the architects of the Master Plan intended. When high school graduation numbers leveled off in the 1970s, UC and CSU responded to declining enrollments by admitting more students as freshmen.⁴⁴ Community colleges, in turn, sought to attract additional students by adding courses in cultural activities, workforce preparation and remedial education. Funding reductions to the community colleges in the wake of the passage of Proposition 13 led to cuts in counseling and testing services and dealt a further blow to transfer.⁴⁵ Transfers declined from 60 percent of all first-time students at CSU in the early 1980s to 43 percent in 2010 (in fall 2017, about 45 percent of first-time students at CSU were transfers).⁴⁶

It was, however, the recessions of the 1990s and 2000s that prompted the most substantial rethinking of the continuing efficacy of the 1960 Master Plan. Between 1990 and 1994, state and local revenues supporting higher education fell by nearly 20 percent and total enrollment fell by 200,000. Student fees at UC doubled between 1990 and 1993.⁴⁷ California had entered into a period of volatility in state support for higher education, as economic cycles and broad shifts in the sources of General Fund revenues caused state spending to enter into a series of boom and bust cycles. California’s spending on higher education fluctuated considerably with annual increases and decreases in higher education

⁴² Commission for the Review of the Master Plan for Higher Education, *The Master Plan Renewed: Unity, Equity, Quality, and Efficiency in California Postsecondary Education* (Sacramento, CA: 1987), p. 2.

⁴³ California Postsecondary Education Commission, *The Master Plan, Then and Now: Policies of the 1960-1975 Master Plan for Higher Education in Light of 1993 Realities* Commission Report 93-6 (April 1993), p. 8.

⁴⁴ Commission for the Review of the Master Plan for Higher Education, *The Challenge of Change: A Reassessment of the California Community College* (Sacramento, CA: 1986).

⁴⁵ LAO, *The Master Plan at 50: Greater Than the Sums of Its Parts – Coordinating Higher Education in California*, p. 13.

⁴⁶ Geiser and Atkinson, “Beyond the Master Plan,” p. 20; CSU Institutional Research and Analyses, Statistical Reports 2017-2018, Undergraduate Transfer Students by Student Level and Sex, Fall 2017 Profile, http://www.calstate.edu/as/stat_reports/2017-2018/f17_09.htm; and First-Time Freshmen by Type of High School of Graduation and Sex, Fall 2017 Profile, http://www.calstate.edu/as/stat_reports/2017-2018/f17_14.htm. Accessed 12-18-2018.

⁴⁷ Thad Nodine, ed., *Shared Responsibility: Strategies to Enhance Quality and Opportunity in California Higher Education. A Report to the Governor, the Legislature, the Higher Education Community, and the Citizens of California* (San Jose, CA: California Higher Education Policy Center, 1996), p. 3; David W. Breneman, *The Challenges Facing California Higher Education: A Memorandum to the New Governor of California* (San Jose, CA: National Center for Public Policy and Higher Education, September 1998), p. 11.

appropriations that sometimes exceeded 10 percent.⁴⁸ Public higher education enrollment (by fall term headcount) increased from 1.66 million students in 1994 to 2.26 million in 2002, fell to 2.12 million in 2004 and then rebounded to 2.39 million by 2008.⁴⁹ Tuition freezes alternated with significant increases in tuition.

The recession of 2008 painfully exposed structural weaknesses in California's system of higher education as the state's budget crisis led to steep cuts to state funding per student, culminating in a nearly 20 percent drop in state funding in 2011-12. Tuition and fees rose sharply to make up the difference.⁵⁰ The annual full time community college fee increased from \$600 in 2008 to \$1,380 in 2012, or from \$20 per unit to \$46 per unit. UC tuition increased by 50 percent between 2008 and 2012, growing from about \$8,000 a year to over \$12,000; CSU tuition rose from about \$3,500 a year to \$5,500 during these years.⁵¹ Budget cuts led campuses to lower enrollment targets and UC/CSU enrollment rates among high school graduates declined.⁵² The CSU rejected record numbers of qualified applicants and the community college system reported in fall 2012 that almost half a million students could not get into classes they needed.⁵³

Although tuition levels stabilized and higher education spending rebounded, the Great Recession called into question the affordability and accessibility of California higher education. Students are bearing a greater financial burden than their predecessors two decades ago. At the same time increased student costs appear to challenge the Master Plan's promise of an affordable education, rising selectivity on the part of California's 4-year segments has seemed to challenge the promise of accessibility.⁵⁴ Many families now view UC campuses as inaccessible, and the number of impacted programs and campuses within the CSU system has also grown. Although a number of factors contribute to this situation, many UC and CSU campuses have denied eligible students admission to their campus of choice, fueling perceptions that California's public universities are increasingly inaccessible to many students.⁵⁵ Enrollment and graduation rates among students from underrepresented minorities, meanwhile, continue to lag those of white and Asian students.⁵⁶

⁴⁸ College Futures Foundation, *Securing the Public Trust: Practical Steps toward Higher Education Finance Reform in California* (San Francisco, CA: January 2017), p. 18, Figure 7.

⁴⁹ Enrollment data from CPEC, Total Enrollment, <http://www.cpec.ca.gov/OnLineData/SelectFirstOptions.ASP?ReportType=Enroll>. Accessed 8-27-2018.

⁵⁰ John Aubrey Douglass, "Investment Patterns in California Higher Education and Policy Options for a Possible Future," CSHE Research & Occasional Paper Series, CSHE.5.02 (May 2002).

⁵¹ California Budget Project, *From State to Student: How State Disinvestment Has Shifted Higher Education Costs to Students and Families* (Sacramento, CA: May 6, 2014), p. 5, Figure 4.

⁵² Hans Johnson, *Defunding Higher Education: What Are the Effects on College Enrollment* (San Francisco, CA: Public Policy Institute of California, 2012).

⁵³ Little Hoover Commission, *A New Plan for A New Economy*, pp. 2-4; Johnson, *Defunding Higher Education*.

⁵⁴ Campaign for College Opportunity, *Access Denied: Rising Selectivity at California's Public Universities* (Los Angeles and Sacramento, CA: November 2015).

⁵⁵ Johnson, *Defunding Higher Education*; W. Richard Scott et al., "The Changing Ecology of Higher Education in the San Francisco Bay Area," in Scott and Kirst, *Higher Education and Silicon Valley*, p. 37, Figure 2.4.

⁵⁶ Colleen Moore and Nancy Shulock, *Divided We Fail: Improving Completion and Closing Racial Gaps in California's Community Colleges* (Sacramento, CA: Institute for Higher Education Leadership & Policy, October 2010);

Does the Master Plan Still Work?

Although there is enduring confidence that the “purpose, principles and structure” of the Master Plan are sound, many analysts and policymakers have argued that the Master Plan is out of date. Over the past decades, budget crises and accompanying budget cuts, dramatic increases in tuition, difficulties accommodating growing demand on the part of students for higher educating, expansion in the number of impacted programs, and aging of its physical infrastructure have all contributed to a growing sense that California’s system of higher education is in a slow-moving crisis. These challenges to California higher education have manifested against a backdrop of escalating poverty, growing income inequality and increasing housing costs, issues which further challenge California’s students, its institutions of postsecondary education, and the whole state. The combination of these budgetary stresses and institutional challenges has led policy analysts and others to ask, “[d]oes the Master Plan still work?”⁵⁷

Two broad perspectives inform the analysis of California higher education in crisis. The first understands the unwinding of the Master Plan primarily as the function of the state’s failure to uphold its guarantee of tuition-free or affordable education for all qualified students. The second focuses on the institutional and structural weaknesses that a deteriorating fiscal situation has revealed and on the failure of the state and institutions of higher education to address these weaknesses. These perspectives are not mutually exclusive. For some, however, the “underfunding” of higher education is the end of point of analysis. For others, it is a starting point.

From Golden Age to Austerity?

In one common interpretation of the recent history of California higher education, the unwinding of the Master Plan is the product of the state’s failure to uphold its covenant with the people to provide affordable education to all. For example, Simon Marginson, a historian of higher education, argues that of all the issues that impacted California higher education in the decades since the negotiation of the Master Plan, “the most significant was the failure of the state and of the mechanisms of the Master Plan to sustain the central social promise of 1960: the provision of access to higher education for all high school graduates who could benefit from it.” The state honored the promise for two decades, “enabling California to achieve a major increase in participation and educational attainment,” and then intermittently during the 1980s and 90s before allowing it to lapse.⁵⁸

Such critiques evoke a “Golden Age” that never existed, at least in terms of a system of higher education that offered cheap, accessible and high quality education to all. Higher education of the 1960s was a far more socially and economically regressive system than historical memory suggests. A study for the

Campaign for College Opportunity, *Affirming Equal Opportunity and Access in the University of California So California Prospering* (Los Angeles and Sacramento, CA: June 2015); David Silver et al., *University Eligibility Study for the Public High School Class of 2015* (RTI International, July 2017).

⁵⁷ Pamela Burdman, “Does California’s Master Plan Still Work?” *Change: The Magazine of Higher Learning* 41, no. 4 (2009): 28-35.

⁵⁸ Simon Marginson, *The Dream is Dead: The Crisis of Clark Kerr’s California Idea of Higher Education* (Oakland, CA: University of California Press, 2016), p. 141 and Marginson, “And the Sky is Grey: The Ambivalent Outcomes of the California Master Plan for Higher Education” *Higher Education Quarterly* 72, no. 1(January 2018): 51-64. See also Christopher Newfield, *The Great Mistake: How We Wrecked Public Universities and How We Can Fix Them* (Baltimore, MD: Johns Hopkins University Press, 2016).

Coordinating Council on the tuition free principle in 1965 concluded, “[i]t seems fair to conclude that tuition free education has failed to maximize college attendance by those from the lower economic levels and that it has benefited primarily those from the upper economic levels which have the highest representation in public colleges.”⁵⁹ During the era of the 1960 Master Plan, moreover, limits on accessibility and retention that are considered by many today to be defects were, in the eyes of the Master Plan’s architects, essential parts of the higher educational system. The junior colleges, in the language of the Master Plan, were to protect their quality “by applying retention standards rigid enough to guarantee that taxpayers’ money is not wasted on individuals who lack capacity or the will to succeed in their studies.” The state colleges and UC had a “heavy obligation to the state to restrict the privilege of entering and remaining to those who are well above average in the college-age group.”⁶⁰ This perspective on educational quality and student retention offers part of the explanation for why the 6-year graduation rate of CSU freshmen in 1975—one of the first cohorts for which such data is available—was 33.5 percent; today it is about 57 percent.⁶¹

With regard to explaining the present problems of California higher education, a singular focus on the decline in per student state support is also simplistic. Between 1960 and 2015, state funding per CSU student, adjusted for inflation, declined by \$1,400, or about 14 percent. State funding per UC student dropped by \$10,400, or by 40 percent.⁶² “Higher education has,” the College Futures Foundation notes, “been collateral damage to a wholesale change in public policy and decision making.”⁶³ College Futures also observes, however, that the complicated structures of higher education finance can make it difficult to find agreement in how to discuss and calculate levels of state support for higher education. Per capita declines in state spending do not necessarily equate with declines in total educational funding for the segments of higher education. The Legislative Analyst’s Office reports that total core funding per student (adjusted for inflation), from the General Fund and from tuition and fee revenue, increased between 1960 and 2015 by about 26.5 percent for CSU students and by about 2 percent for UC students, although current total core funding is below peaks attained in the 1990s.⁶⁴

Although increases in tuition fuel perceptions that California has failed to honor the Master Plan’s promise of affordable higher education, student aid has risen to accommodate increasing tuition and now extends to middle-class scholarships. For about 60 percent of undergraduates, the UC and CSU remain effectively tuition free and about half of community college students receive full fee waivers.⁶⁵

⁵⁹ Willard B. Spalding et al., *An Evaluation of the Tuition Free Principle in California Public Higher Education* (Sacramento and San Francisco, CA: Coordinating Council for Higher Education, May 1965), p. 34. See also W. Lee Hansen and Burton A. Weisbrod, “The Distribution of Costs and Direct Benefits of Public Higher Education: The Case of California,” *The Journal of Human Resources* 4, no. 2(Spring 1969): 176-191.

⁶⁰ *A Master Plan for Higher Education in California* (1960), p. 66.

⁶¹ California State University Office of the Chancellor, *CSU Undergraduate Outcomes Report*, p. 5.

⁶² LAO, *Overview of Higher Education in California*, p. 6.

⁶³ College Futures Foundation, *Securing the Public Trust*, p. 11.

⁶⁴ These percentages are calculated from the figures in LAO, *Overview of Higher Education in California*, p. 6; LAO, *CSU and UC: Major Budgets Trends* (Sacramento, CA: August 14, 2018).

⁶⁵ LAO, *The 2018-19 Budget: Higher Education Analysis* (Sacramento, CA: February 15 2018), p. 16. The LAO also finds that half of CSU and UC students graduate with debt, with an average debt at graduation of \$20,500; this figure is significantly lower than the average debt load of \$27,300 for graduates of 4-year public universities

There is limited research into the present condition of net subsidies for students from different income class brackets within California, but national studies suggest that indirect subsidies for public university students today may be flat or slightly progressive, as a result of tuition charges on financially able students and financial aid for eligible students.⁶⁶ As in the 1960s, the main source of student costs lies in increasing living expenses. These present an urgent challenge but indicate that solutions to the affordability question will require looking beyond higher education and financial aid policy to confront escalating housing costs, or creativity from the segments to subsidize costs further for students.

Leadership and Planning

In contrast to evocations of a Golden Age of the Master Plan, a number of researchers, analysts and policy groups criticize California for a lack of state leadership and failing to confront the present problems of higher education. The state's demographics and workforce demands have changed dramatically since 1960. Revenue streams have grown more volatile and their rate of growth has declined. Constitutional restrictions on state spending, including Proposition 98, which protects revenues for K-12 education and the community colleges, and the growing cost of health and human services constrain the portion of the state budget available for higher education spending.⁶⁷

Higher education is also changing in ways that the Master Plan never anticipated. The Master Plan focused on public colleges and universities; yet, in 2012, there were 30 public institutions of higher education in the San Francisco Bay Area, compared to 119 non-profit institutions and 227 for-profit postsecondary schools. Between 2004 and 2011, enrollment at for-profit colleges in California tripled while enrollment in other institutions of higher education grew by only 12 percent. Enrollment in the for-profit higher education sector subsequently declined after the introduction of restrictions on institutional eligibility for Cal Grants in 2011 and tighter federal regulations in 2014-15.⁶⁸ The rise of for-profit institutions points, however, to unmet demand, especially from non-traditional students, for accessible and convenient education and an education that promises faster pathways to jobs. The Master Plan never contemplated the rise of for-profit colleges or how the educational needs of adult learners would grow.

According to some researchers, California has failed to provide leadership or vision in the face of a changing higher education environment that requires colleges and universities to serve a broader population of students in a time of increasingly straitened resources. The LAO observed in 2009, “[o]verall, the state's vision for its higher education system is less cohesive than it was a half century

nationwide. See also Patrick A. Lapid and John Aubrey Douglass, *College Affordability and the Emergence of Progressive Tuition Models: Are New Financial Aid Policies at Major Public Universities Working?* CSHE Research & Occasional Paper Series, CSHE.7.16 (June 2016).

⁶⁶ Jason Delisle and Kim Dancy, “Do State Subsidies for Public Universities Favor the Affluent?” Economic Studies at Brookings, Evidence Speaks Reports, Vol 1, #23 (July 28, 2016).

⁶⁷ College Futures Foundation, *Securing the Public Trust*, p. 18.

⁶⁸ Scott, “The Changing Ecology of Higher Education in the San Francisco Bay Area,” in Scott and Kirst, *Higher Education and Silicon Valley*, pp. 27-37; Hans Johnson, “The Rise and Fall of Enrollment at For-Profit Colleges,” *Viewpoints: The PPIC Blog* (June 28, 2016), <http://www.ppic.org/blog/the-rise-and-fall-of-enrollment-at-for-profit-colleges/>. Accessed 3-5-2018.

ago.”⁶⁹ Legislative interventions in higher education have been uncoordinated and amendments to the Donahoe Act “have been adopted piecemeal, addressing specific issues largely in isolation of broader higher education themes.”⁷⁰ Efforts to increase access at community colleges, for example, proceeded in parallel but not in coordination with steps to meet the financial and educational needs of low income and first generation college goers.⁷¹ “For at least the past three decades,” Patrick Callan, a former director of CPEC and president of the Higher Education Policy Institute, writes, “California’s governors and legislators have been reluctant to assert statewide priorities, particularly when confronted with fiscal problems.” As a result of state leaders’ deference to the segments of the higher education system, “overall public priorities, such as access, affordability, and the transfer function, have often been inadequately protected in hard economic times and overlooked in good ones.”⁷²

Critiques of the inadequacy of coordination and shared leadership among the segments of California higher education date back to the earliest reviews of the Master Plan. The creation of the California Postsecondary Educational Commission was intended to address deficiencies in coordination and planning by providing for greater oversight of the segments of higher education. Yet CPEC did not provide the coordination or planning that was intended. The 1987 review commission observed that CPEC’s establishment as a lay commission eliminated a forum for cooperation among the segmental leaders. “A valuable agency for evaluation and policy analysis,” CPEC could not be “the unifying body that is now so clearly needed.”⁷³ All of the legislative reviews of the Master Plan, meanwhile, recommended increasing the coordinating entity’s authority.⁷⁴ In the wake of CPEC’s elimination because of its ineffectiveness as a coordinating body (particularly illustrated by the creation of the UC Irvine Law School in spite of CPEC’s opposition), reports have encouraged the creation of a new coordinating body. The history of CPEC suggests, however, that the coordinating body needs to be an instrument rather than a source of leadership; it is unlikely to provide effective or sustained leadership in itself.⁷⁵

Researchers into the history of the Master Plan also observe that problems of coordination and governance are an inherent feature of the Master Plan as much as they are products of subsequent failures of political and segmental leadership. The Master Plan “created three statewide silos in California higher education” as the architects of the plan sought to negotiate a treaty among the institutions of postsecondary education. “The Master Plan was really designed so as not to require much competition or cooperation, but rather so that each segment could ‘focus on its own mission.’”⁷⁶ California’s institutions of higher education struggle to cooperate and coordinate even with regard to

⁶⁹ LAO, *The Master Plan at 50: Assessing California’s Vision for Higher Education*, p. 7.

⁷⁰ Ibid., p. 5.

⁷¹ Nancy Shulock and Colleen Moore, *Invest in Success: How Finance Policy Can Increase Student Success at California’s Community Colleges* (Sacramento, CA: Institute for Higher Education Leadership and Policy, October 2007), pp. 2-5.

⁷² Callan, *California Higher Education*, p. 22.

⁷³ *The Master Plan Renewed* (1987), p. 3.

⁷⁴ California Competes, *Moving Past the Master Plan*, p. 3.

⁷⁵ Little Hoover Commission, *A New Plan for a New Economy*, pp. 51-2.

⁷⁶ Kathy Reeve Bracco and Patrick M. Callan, *Competition and Collaboration in California Higher Education* (San Jose, CA: National Center for Public Policy and Higher Education, January 2002), p. 5.

well-established missions like transfer. One UC faculty member participating in an intersegmental task force on transfer complained, “[w]e have three separate systems that ultimately have no accountability toward one another, and I think that really holds us back.”⁷⁷ In a more pointed critique, Patrick Callan wrote that while the Master Plan was the solution to mission creep and politicized expansion in 1960, it is “now a substantial part of the problem.”⁷⁸

In light of such criticisms, a number of analysts and reports have called for a new Master Plan for higher education in California.⁷⁹ Others, meanwhile, have encouraged California to “move past” the Master Plan. For example, California Competes highlights that addressing the challenges facing the state “requires immediate action on specific and pragmatic policies, rather than an attempt to completely rewrite the Master Plan.”⁸⁰

Game Changers—Technological Transformations on the Horizon

As substantial as the changes in California’s economy between 1960 and today have been, future technological and economic changes may have an even more profound impact on the world of work and on higher education. A wide range of technological and industry analysts have identified the capacity for rapid advances in artificial intelligence and in robotics to replace human workers on a massive scale. A 2013 Oxford study found that automation might put almost half of U.S. jobs at risk over the next two decades; other reports have suggested that the ability of automation and artificial intelligence to replace those human workers may be even more rapid.⁸¹ In the past, concern about the impact of technological change on the workforce often focused on the capacity of robots to replace manufacturing workers; now, artificial intelligence threatens the white-collar jobs for which college diplomas have for decades been the entryway.

Such technological changes will not only impact people, they may upend traditional institutions of higher education themselves. The former president of Harvard University, Derek Bok, describes today’s technological revolutions as a “force more sweeping, more rapid, and more unpredictable than anything previously experienced by colleges and universities.”⁸² The rapid development, proliferation and improvement of online education challenges traditional conceptions of the residential and campus-based university and raises fundamental questions about how best to make higher education accessible, available and equitable. Technological developments also call into question the century-old structuring of higher education curricula and credentials. Some advocates for remaking higher education propose

⁷⁷ Carrie B. Kisker, Arthur M. Cohen and Richard L. Wagoner, *Reforming Transfer and Articulation in California: Four Statewide Solutions for Creating a More Successful and Seamless Transfer Path to the Baccalaureate* (Los Angeles, CA: Center for the Study of Community Colleges, April 2010), p. 11.

⁷⁸ Patrick Callan, “The Perils of Success,” in *Clark Kerr’s World of Higher Education Reaches the 21st Century*, ed. Sheldon Rothblatt (New York: Springer, 2012), p. 82.

⁷⁹ Breneman, *The Challenges Facing CA Higher Education*, pp. 30-1.

⁸⁰ California Competes, *Moving Past the Master Plan*.

⁸¹ Carl Benedikt Frey and Michael A. Osborne, *The Future of Employment: How Susceptible Are Jobs to Computerisation?* (Oxford: Oxford Martin Programme on Technology and Employment, September 17, 2013—Working Paper); Joseph E. Aoun, *Robot-Proof: Higher Education in the Age of Artificial Intelligence* (Cambridge, MA: The MIT Press, 2017), p. xiii.

⁸² Derek Bok, *The Struggle to Reform Our Colleges* (Princeton, NJ: Princeton University Press, 2017), pp. 92-3.

“unbundling” the college degree and allowing students to pursue personalized curricula through individual certificates, digital badges and nanodegrees designed to demonstrate competency in particular skills. New entrants to the world of higher education, ranging from national for-profit universities to coding “bootcamps,” promise students rapid and convenient training for in-demand skills.⁸³

The rise of new players on the higher education landscape suggests widespread desire for new ways to deliver higher education content and for opportunities for non-traditional students and adults to learn additional skills conveniently and quickly. The rise of for-profit universities and bootcamps reveal substantial demand for training and re-skilling, including from those with baccalaureate and advanced degrees.⁸⁴ The popularity and possibilities of online education, meanwhile, points to the importance of institutions of higher education engaging more fully with technological change to ensure that it works in the best interests of students. Higher education leaders emphasize the possibilities of online education to expand access and help combat higher education’s “cost disease,” the tendency for institutional costs per student to rise faster than costs in general; they also warn that, depending on how it is implemented, online education can either enhance educational quality and access or exacerbate inequities and barriers among institutions.⁸⁵

Notably, the transformation of higher education, through technology, may also ultimately enhance the value and importance of higher education. Automation, artificial intelligence and machine learning all threaten jobs once held by human workers; they also raise demand for workers who can use and work with these technologies, as well as for the engineers, programmers and data scientists who can construct computer models and develop algorithms. More broadly, technological development puts a premium on human skills that are more difficult to automate and less conducive to machine learning. Education experts have identified skills like critical analysis, adaptability, communication, empathy, collaboration, cultural and social sensitivity as vital for success in the 21st century economy and workplace.⁸⁶ These skills will enable workers to navigate the promises and challenges of an uncertain world of work and prepare them for the re-skilling and life-long learning that will likely be necessary to remain ahead of technical change. These are also skills that students may develop most fully in the context of the coherent credential and degree programs of colleges and universities.

⁸³ W. Richard Scott et al., “Broader Forces Shaping the Fields of Higher Education and the Regional Economy,” and Michael Kirst et al., “Policy Perspectives,” in Scott and Kirst, *Silicon Valley and Higher Education*, pp. 136-7, 220-3; Bok, *The Struggle to Reform Our Colleges*, pp. 84-92.

⁸⁴ For an anecdotal illustration of retraining for holders of advanced degrees, see Steve Lohr, “Where the STEM Jobs Are (and Where They Aren’t),” *The New York Times* (November 1, 2017), <https://www.nytimes.com/2017/11/01/education/edlife/stem-jobs-industry-careers.html>. Accessed 2/28/2018.

⁸⁵ William G. Bowen, *The ‘Cost Disease’ In Higher Education: Is Technology the Answer?* (Stanford, CA: The Tanner Lectures, October 2012); Michael S. McPherson and Lawrence S. Bacow, “Online Higher Education: Beyond the Hype Cycle,” *Journal of Economic Perspectives* 29, no. 4 (Fall 2015): 135-154.

⁸⁶ New World of Work, “What Are 21st Century Skills?” <https://www.newworldofwork.org/college-resources/>. Accessed 8-27-2018.

The considerable opportunities and potential challenges that technological developments present for California's colleges and universities underscore the importance of greater leadership, coordination and collaboration in California's system of higher education.

III. Future Workforce Needs

Although the Master Plan was a substantially comprehensive document for its time, thoughts on life-long education, re-skilling or workforce alignment did not factor into it. While early reviews of the Master Plan addressed the importance of retraining and of providing educational opportunities for adult learners, they also placed a greater emphasis on the cultivation of an educated citizenry than on workforce development.⁸⁷

Today there is growing concern that California's institutions of higher education may not be meeting the state's future workforce needs. The Public Policy Institute of California (PPIC) estimates that the state faces a deficit of more than one million bachelor's degree holders by 2030, as a result of Baby Boomer retirements, relatively low rates of four-year college enrollment and degree attainment and growing demand for highly educated workers. PPIC suggests that California will also face a gap of 1.5 million middle-skilled workers by 2025.⁸⁸ California Competes estimates that, for California to be among the top 10 states by 2025 in terms of the proportion of adults with at least an associate's degree, the state's universities and colleges need to graduate 2.4 million more degree-holders than they are on track to produce.⁸⁹ In the face of different estimates of California's degree gap, the College Futures Foundation observes, "[r]easonable people might disagree about the precise number of new degrees needed in California, but whether the number is a half a million or a million, this is more than will be produced if current trends in degree attainment continue."⁹⁰ California's institutions of higher education, meanwhile, are also not graduating enough students in STEM fields to meet current or anticipated demands.⁹¹

The economic importance of higher education is growing. California remains a well-educated state, but its rate of degree production lags that of other states. In 1979, 21 percent of Californians possessed a bachelor's degree or higher; only five states separated California from the most educated state, Colorado, of whose population 24.2 percent had a bachelor's or higher. In 2014, California was the 14th most educated state in terms of the percentage of the population with a bachelor's degree or higher and ten percentage points separated California from the most educated state, Massachusetts (45.6

⁸⁷ *The California Master Plan for Higher Education in the Seventies and Beyond* (1972), p. x.

⁸⁸ Hans Johnson, *Higher Education in California: New Goals for the Master Plan* (San Francisco, CA: Public Policy Institute of California, April 2010), pp. 6-8; Hans Johnson et al., "Addressing California's Skills Gap," in *Higher Education in California* (San Francisco, CA: Public Policy Institute of California, 2017).

⁸⁹ California Competes, *Mind the Gap: Delivering on California's Promise for Higher Education* (Berkeley, CA, 2015).

⁹⁰ College Futures Foundation, *Securing the Public Trust*, p. 8.

⁹¹ Campaign for College Opportunity, *Needed: Sy(STEM)ic Response: How California's Public Colleges and Universities are Key to Strengthening the Science, Technology, Engineering, and Math (STEM) and Health Workforce* (Los Angeles and Sacramento, CA: June 2016).

percent).⁹² If California maintains its current rate of baccalaureate degree production, the percentage of the state's working population with a bachelor's degree or higher will be essentially the same in 2030 as it is today.⁹³ Countries in Europe and Asia and other states, meanwhile, are expanding their college-educated populations. In light of California's high cost of living and the mobility of capital, this situation may not bode well for California's economic future. It is also a source of concern that employers in California may look out of state or internationally for highly educated workers while individuals born in California struggle to find well-paying jobs.⁹⁴

While statewide gaps in the provision of degrees and certificates are important to understand and address, issues of regional alignment highlight complexities in the relationship between economies and a higher education infrastructure that substantially dates to the era of the Master Plan. Michael Kirst and W. Richard Scott show that the San Francisco Bay Area—a region constituting 20 percent of California's population but which produced half of the state's new employment between 2007 and 2017—is substantially underserved by public institutions of higher education. Only three CSU campuses serve a region of more than seven million people; and not a single 4-year institution of public higher education is located in Contra Costa County, home to a million Californians. It is interesting to note that the foreign-born share of the population in STEM professions in Silicon Valley is significantly higher than it is in other tech hubs (58 percent compared to 34 percent in Seattle and 32 percent in Boston) and that only 20 percent of STEM professionals in Silicon Valley were born in California. In contrast, 31 percent of STEM professionals in Boston and 36 percent of STEM professionals in Austin were born in state.⁹⁵ These data raise interesting questions about higher education's ability to keep up with economic demand, and what regional consequences might result.

Other regions also display evidence of misalignment. The Center for a Competitive Workforce projects that the Los Angeles basin will see 67,450 job openings in twenty middle-skill occupations in the next five years. Yet, current completion trends in relevant regional community colleges training programs would leave 42 percent of those positions unfilled.⁹⁶ Low rates of higher education enrollment and completion in California's San Joaquin Valley limit that region's ability either to diversify its economy or to meet anticipated workforce needs.⁹⁷

⁹² Reidenbach, *How California's Workforce is Changing*.

⁹³ Hans Johnson, Marisol Cuellar Mejia and Sarah Bohn, *Will California Run Out of College Graduates* (San Francisco, CA: Public Policy Institute of California, October 2015).

⁹⁴ Hans Johnson, "California's Brain Gain," Public Policy Institute of California Blog Entry (January 3, 2018), <https://www.ppic.org/blog/californias-brain-gain/>. Accessed 12-18-2018.

⁹⁵ Scott, "Broader Forces Shaping the Fields of Higher Education and the Regional Economy," and Kirst, "Policy Perspectives," in *Higher Education and Silicon Valley*, pp. 96-8, 204. The high levels of out-of-state and foreign STEM workers in Silicon Valley is, of course, also testimony to and a product of the region's immense attraction as a leading global hub of high-tech industries, innovation and venture capital.

⁹⁶ Somjita Mitra, et al., *L.A. & Orange County Community Colleges: Powering Economic Opportunity* (Center for a Competitive Workforce, October 2017), p. 75.

⁹⁷ Hans Johnson, Kevin Cook and Marisol Cuellar Mejia, *Meeting California's Need for College Graduates: A Regional Perspective* (San Francisco, CA: Public Policy Institute of California, June 2017), p. 6.

The challenge facing California is, however, not just one of degree production; it is one of workforce alignment in the face of a rapidly changing economy. Among its final reports, CPEC studied the other side of workforce and degree alignment: the number of degree holders employed in jobs for which a degree is unnecessary. In 2009, CPEC found that 16-to-18 percent of graduates with a bachelor's degree worked in non-degree occupations and that the wage premium for university degrees varied considerably among different occupations.⁹⁸ A 2015 study from the California Budget & Policy Center found that 15 percent of California's low-wage workers hold a bachelor's degree.⁹⁹ Some research suggests, meanwhile, that employers may be unnecessarily selective in insisting on bachelor's degrees for some jobs, fueling a process of degree inflation that is excluding both capable young adults and experienced older workers from job opportunities.¹⁰⁰ Producing more baccalaureate degrees and subbaccalaureate credentials is vital, but it is only one step towards fulfilling future workforce needs. Beyond educating and graduating more students, colleges and universities need to ensure that those students graduate with skills that will allow them to succeed in the workforce today. They also need to prepare students to be able to respond to changing workforce demand by shifting careers and mastering new fields of knowledge tomorrow.

There is a broad consensus among economists and higher education experts that re-skilling and life-long learning are central to the future of work. Administrators and faculty emphasize that we do not know what work will look like in 10 years. Literature on the future of work echoes such uncertainty. In 2014, for example, respondents to a survey conducted by Pew Research Center and Elon University's Imagining the Internet Center divided almost evenly when asked whether artificial intelligence and robotics would create more jobs than they would destroy.¹⁰¹ As noted above, however, there is broad consensus that automation and digitization threaten low-, middle-, and even high-skill jobs; workers will require opportunities to upgrade their skills to adapt to changing job requirements.¹⁰² California needs to maintain an educated populace that is ready for life-long learning and that population needs a system of higher education that provides opportunities and frameworks for upgrading their skills to meet uncertain, unpredictable and rapidly changing economic conditions.

Increasing Enrollment and Completion

Researchers and policy groups suggest that higher rates of postsecondary enrollment and completion are required to meet anticipated workforce needs and to provide California's citizens with access to the education and credentials necessary to compete and thrive in the 21st century economy. An emphasis on expanding enrollment with regard to 4-year institutions and on encouraging completion represents a significant conceptual and policy shift from the priorities of the 1960 Master Plan. Where the Master

⁹⁸ Mallory Angeli and Ryan Fuller, *The Degree Gap: Are University Graduates Making Full Use of Their Degrees* (Sacramento, CA: California Postsecondary Education Commission, September 2009).

⁹⁹ Reidenbach, *How California's Workforce is Changing*.

¹⁰⁰ Joseph B. Fuller and Manjari Raman, *Dismissed by Degrees: How Degree Inflation is Undermining U.S. Competitiveness and Hurting America's Middle Class* (Accenture, Grads of Life, Harvard Business School: October 2017).

¹⁰¹ Lee Rainie and Janna Anderson, *The Future of Jobs and Jobs Training* (Pew Research Center, May 2017).

¹⁰² Mark Muro, et al. *Digitalization and the American Workforce* (Washington, DC: Metropolitan Policy Program at Brookings, November 2017).

Plan restricted access to the 4-year segments and did not address degree completion, current analysis places an emphasis on accessibility to CSU and UC and outcomes.

In addition, although the original Master Plan did not devote much attention to issues of diversity and inclusion, these issues now substantially frame discussions of enrollment and completion. California in 1960 was substantially homogeneous and understandings of systemic inequities in society were limited.¹⁰³ In contrast, reports on higher education in California now broadly agree on the necessity of expanding postsecondary accessibility and eligibility. To analysts and policymakers, this is a matter of equity. California's African-American and Latino populations are underrepresented among degree holders and, though this varies by campus, underserved by California's public 4-year schools. It is also a matter of workforce needs and economic necessity; as California's population continues to diversify, the state has to improve degree attainment among underrepresented populations in order to maintain a workforce that meets employer needs.¹⁰⁴ Moreover, as well-paying jobs increasingly require workers to possess bachelor's degrees or subbaccalaureate credentials, it is imperative that students have access to higher education and that institutions of higher education provide them with clear and navigable pathways to completion.

Enrollment

Higher education enrollment among traditional college age students is increasing. In 2000, 35 percent of Californians between 18 and 24 years of age reported attending an institution of higher education in California; in 2015, that figure was 47 percent. This rate of college attendance among 18-24 year olds was 9th highest among states.¹⁰⁵ In comparison to other states, however, California higher education enrollment is substantially dominated by community college attendance. Enrollment growth at CSU and UC is below the rate of increase that PPIC and California Competes suggest is necessary to bridge the state's degree gap. Because the Supplemental Reporting Language highlighted the need to identify cross-segmental strategies to increase higher education enrollment and completion (as one of three areas), the following discussion of enrollment focuses on baccalaureate enrollment and completion.

At the 4-year segments, expanding enrollment is, in part, a function of eligibility and accessibility. It is a matter of determining which students should be eligible for admission to UC and CSU and readying students for higher education. Expanding student access to California's 4-year public universities depends, in large part, on sustaining and continuing progress in K-12 education and transfers from community colleges. Increasing enrollment is also a function of institutional and budgetary capacity to accommodate additional students and of devising new approaches to the challenges of campus capacity, including accelerating completion for enrolled students and funding enrollment growth. More broadly, expanding enrollment and completion and meeting projected workforce demands should also entail making pathways to degrees available to adults who enrolled in college but did not complete their

¹⁰³ California Competes, *Moving Past the Master Plan*, pp. 2-3.

¹⁰⁴ College Futures Foundation, *Securing Public Trust*, pp. 8-9.

¹⁰⁵ LAO, *The 2018-19 Budget: Higher Education Analysis*, p. 8.

credentials. Possible approaches for encouraging such access for adult learners is discussed in the section, “Re-skilling Opportunities for Adults,” as well as in this section.

Eligibility

Eligibility levels for UC and CSU are a function of Master Plan policies. The 1960 Master Plan recommended that the UC and CSU systems draw their freshmen classes from the top 12.5 percent and 33.3 percent, respectively, of graduating public high school students. These targets were reductions in existing eligibility pools for the 4-year institutions and were originally intended to restrict entry into the UC and CSU as a means of maintaining institutional quality and containing costs in the face of expanding enrollment. Although these targets were never established in statute, they have guided UC and CSU admissions policies; the 4-year segments have periodically revised admissions requirements when their eligibility pools have fallen above or below Master Plan guidelines, as when UC tightened its admissions criteria after the 2003 eligibility study found it drawing from outside its eligibility pool.

The most recent eligibility study found that eligibility for both UC and CSU freshmen admission for the high school class of 2015 exceeded existing targets recommended by the Master Plan. It also revealed a significant expansion in CSU eligibility; CSU eligibility among high school graduates expanded from 32.7 percent in 2007 to 40.8 percent in 2015. This growth in CSU eligibility was largely a product of improvements in high school education—between 2006 and 2017, the proportion of high school graduates completing A-G requirements for UC/CSU admission rose from 35 to 45 percent.¹⁰⁶ Eligibility for UC admission, meanwhile, rose from 13.4 percent of high school graduates in 2007 to 13.9 percent in 2015.¹⁰⁷ The expansion of UC and CSU eligibility beyond Master Plan targets raises the question of whether the segments should raise admission standards to remain within Master Plan guidelines or continue to draw from beyond the Plan’s eligibility pools. Notably, the current eligibility rates approximate revised rates recommended by PPIC and the Campaign for College Opportunity; those organizations have recommended an expansion of UC and CSU eligibility targets to 15 and 40 percent, respectively, of graduating high school students in order to expand accessibility and enrollment.¹⁰⁸

The growth in general eligibility rates masks, however, persistent differences in eligibility rates among ethnic groups and in regional eligibility rates. Latino, African American and Native American eligibility rates for the UC all fall below 10 percent. Latino eligibility for the CSU has risen by almost ten percentage points since the last eligibility study in 2007 and has reached 31.9 percent, yet only Asian American students have a CSU eligibility rate of greater than 40 percent.¹⁰⁹ UC eligibility in Northern Counties and Sacramento Valley (10%), San Joaquin Valley and Sierras (9%), and in the Inland Empire (12%) are half what they are in the San Francisco Bay Area (23%).¹¹⁰ Meanwhile, enrollment rates for

¹⁰⁶ Jacob Jackson and Olga Rodriguez, *College Readiness in California* (San Francisco, CA: Public Policy Institute of California, October 2017).

¹⁰⁷ Silver, *University Eligibility Study for the Public High School Class of 2015*.

¹⁰⁸ Johnson, *Higher Education in California: New Goals for the Master Plan*, pp. 6-8; Campaign for College Opportunity, *Access Denied Universities*.

¹⁰⁹ Asian American eligibility varies considerably by subgroup. The 2015 eligibility study found that Asian American CSU eligibility rates ranged from 56.6 percent for Southeast Asian Americans to 74.2 percent for East Asian Americans. See Silver, *University Eligibility Study for the Public High School Class of 2015*, p. 9, Table 2c.

¹¹⁰ Silver, *University Eligibility Study for the Public High School Class of 2015*.

underrepresented minority students at some CSU and, especially, UC campuses have still not recovered from declines following the passage of Proposition 209 in 1996, which prohibited state governmental institutions from discriminating or granting preference on the basis of race, sex or ethnicity.¹¹¹

Growth in the number of students eligible for UC/CSU has also raised concerns about accessibility in terms of the capacity of systems and campuses to accommodate additional enrollment. A number of higher education organizations and analysts have identified a significant gap between the portion of students who are eligible for CSU admission and those who are admitted. Between 2013 and 2016, CSU denied admission to 69,000 freshmen applicants who were CSU eligible and to 35,000 eligible transfer students.¹¹² The apparently substantial gap between CSU eligibility and admission is complicated, however, by several factors. Of the 31,402 students who were qualified but not admitted in fall 2016, three quarters applied to only one CSU campus, indicating that many of these students were likely place-bound and limited in their applications to local schools. In addition, 12,000 of these qualified but not admitted students applied only to San Luis Obispo or San Diego State, suggesting that some eligible students denied admission to CSU may have sought admission only to specific, selective programs or campuses.¹¹³ The Legislature has sought to remedy the mismatch between local preference and acceptance by requiring that CSU offer admission to local students and develop policies for referring applications to other campuses.¹¹⁴

Encouraging Access

Researchers and analysts observe that questions of accessibility are multi-faceted. Formal academic eligibility for admission is one aspect of accessibility. Accessibility is also a function of the extent to which the student perceives or is encouraged to perceive higher education as a viable opportunity and aims to complete A-G requirements accordingly. Surveys suggest that California families overwhelmingly want their children to graduate from college. According to a PPIC survey, more than 80 percent of California parents want their children to obtain a bachelor's degree (34 percent) or a graduate degree (51 percent).¹¹⁵ Programs to expand readiness for higher education, like the CSU Early Assessment Program, aim to encourage students to approach higher education as an accessible objective. Nevertheless, for students whose family members did not attend college, higher education can still be an abstract and unfamiliar goal. Although educators have encouraged completion of A-G requirements

¹¹¹ William C. Kidder and Patricia Gándara, "Two Decades after the Affirmative Action Ban: Evaluating the University of California's Race-Neutral Efforts," (Educational Testing Service, October 2015); Campaign for College Opportunity, *The State of Higher Education in California –Black Report* (Los Angeles and Sacramento: May 2015), p. 18.

¹¹² Niu Gao and Hans Johnson, *Improving College Pathways in California* (San Francisco, CA: Public Policy Institute of California, November 2017), p. 19.

¹¹³ CSU calculates that 57 percent of qualified-but-denied students are attending a California institution of higher education, whether a UC, private institution or community college. California State Assembly Budget Subcommittee No. 2 on Education Finance, "Agenda, Wednesday, April 26, 2017—California State University."

¹¹⁴ Kevin Cook, "New CSU Admissions Policy Could Increase Access, Enrollment," Public Policy Institute of California (September 5, 2017), <http://www.ppic.org/blog/new-csu-admissions-policy-increase-access-enrollment/>. Accessed 8-23-2018.

¹¹⁵ Mark Baldassare et al., *Californians & Education* (San Francisco, CA: Public Policy Institute of California, April 2017), p. 27.

and also worked to qualify many career technical education courses as A-G equivalent, many students remain unaware of what these requirements are or whether they are successfully completing them. In addition, accessibility is a function both of affordability and of the student's perception that higher education is financially achievable. Among place-bound students, access to higher education may also be a function of space for them at a nearby campus.

Improving higher education accessibility depends on keeping students on pathways to college. A recent PPIC study of college pathways in California suggests that many academically capable students fall off existing pathways in high school; almost a third of students in the sample PPIC studied who passed algebra 1 with an A or B did not proceed on to geometry. The researchers identified several factors behind such lack of progress. They observed that California's high school graduation requirements do not align with UC and CSU admission requirements; many districts require only two years of math and three years of English courses in order to graduate from high school, while UC and CSU admissions require three and four years of these subjects, respectively.¹¹⁶ They also suggest that course placement policies at some high schools misplace students into courses that do not lead to A-G completion and that academic counseling, especially in schools without a strong college-going history, often fails to provide students with necessary information about college pathways. PPIC recommends that districts revise course placement and advising policies to encourage students to take the full sequence of A-G courses.¹¹⁷

In addition to improved high school counseling and course placement, collaboration between institutions of K-12 and higher education can help to cultivate a "college-going culture" among students. Regional college and university promise programs, like the Long Beach Promise and Central Valley Promise Programs, have a proven record of expanding higher education accessibility and increasing regional enrollment. These programs offer scholarships or free-tuition guarantees for students who enroll in higher education, usually community college, and provide a framework that helps to keep students on track to finish secondary studies and enroll in college. In some cases, they also provide a pathway to CSU admission.¹¹⁸ Policymakers have recently enacted budget and policy language to promote this kind of sustained and intense interaction between K-12 and higher education.¹¹⁹ Continuing to foster closer cooperation among institutions of K-12 and higher education appears to be an effective means of encouraging students to aspire to higher education and helping them to understand how to transform that aspiration into a reality. In addition, redoubling efforts on seamless transfer from community colleges and outreach to adult noncompleters, as discussed earlier, are also important areas to highlight.

¹¹⁶ PPIC notes that most school districts have implemented additional graduation requirements, but many students still do not need to take the progression of courses required for UC/CSU admission in order to graduate from high school. This shapes student course-taking patterns. Gao and Johnson, *Improving College Pathways in California*, pp. 14-15.

¹¹⁷ Ibid., *Improving College Pathways in California*, pp. 11, 14-15, 22-3.

¹¹⁸ Rel West, *The College Promise in California: A Collection of Program Profiles* (WestEd, August 2016), p. 3.

¹¹⁹ AB 19 (Santiago) - California College Promise, Chapter 735, Statutes of 2017.

Expanding Capacity

Public Policy Institute of California observes that an expansion in baccalaureate attainment will probably center substantially on expanding enrollment at CSU and UC, which together account for the bulk of bachelor's enrollments in California.¹²⁰ In 2017, UC and CSU responded to a legislative request for reports on the cost of implementing a PPIC plan that aimed to increase bachelor's production by a million graduates by 2030 through increased freshmen enrollment, increased transfer and higher rates of retention and graduation.¹²¹ CSU estimated that graduating an additional 480,000 students by 2030 would ultimately require new, permanent state funding of \$1.3-1.4 billion.¹²² UC estimated that graduating an additional 250,000 baccalaureate students would require an increase in UC's annual appropriation of \$1 billion by 2024-25, as well as an additional \$460 million in Cal Grant expenditures.¹²³ UC also estimated that accommodating these additional students would generate additional capital costs of \$2.5 to \$3 billion; CSU did not estimate the additional capital costs resulting from expanded enrollment, but reiterated a need for \$12.5 billion for academic and self-support projects between 2017-18 and 2021-22.

These estimates are based on the existing campus and residential models of higher education, as well as on current rates of facility use and present student-faculty ratios. These estimates do not assume that any of the factors that go into producing existing higher education cost structures would be addressed. With regard to campus capacity, the LAO concluded, in a January 2017 report responding to a legislative requirement to assess whether a new 4-year campus was warranted, that under existing legislative facility use expectations, the CSU system could then accommodate 31,000 additional students through the fall and spring terms and 61,000 additional students in the summer.¹²⁴ Notably, students appear to be favorable to the prospect of increased summer enrollment; in a survey of CSU students, 77 percent of respondents were willing or very willing to enroll in summer courses to facilitate timely completion.¹²⁵ There is reason to question whether underutilization of campus facilities in the summer, in terms of legislative facility use expectations, is the product of insufficient student demand or other drivers such as faculty availability or preference. The LAO's analysis also suggested that more extensive use of facilities at UC campuses could accommodate at least 33,000 students and greater summer enrollment would allow campuses to enroll 16,000 additional students. On the other hand, campus capacity also differs substantially among institutions and some kinds of facilities, like teaching labs, may already be

¹²⁰ Johnson, *Higher Education in California: New Goals for the Master Plan*.

¹²¹ When PPIC in 2010 put forward a plan to increase bachelor's attainment in California by one million degrees by 2025, it estimated that the plan for expanding enrollment would, when fully implemented, cost the state an extra \$1.6 billion annually in General Fund expenditures, see Johnson, *Higher Education in California: New Goals for the Master Plan*, p. 15.

¹²² California State University Office of the Chancellor, *Towards Greater Statewide Degree Attainment by 2030 -- California State University Response to Questions Posed in the Budget Act of 2016* (March 1, 2017).

¹²³ University of California Office of the President, *Enrollment and Budgetary Scenarios for Increasing Degrees Awarded at UC* (March 2017).

¹²⁴ LAO, *Assessing UC and CSU Enrollment and Capacity* (Sacramento CA: January 19, 2017).

¹²⁵ Colleen Moore and Connie Tan, "Get Me from Point A to Point B:" *Student Perspectives on Barriers to Timely Graduation at the California State University* (Sacramento, CA: CSU Student Success Network and Education Insights Center, February 2018), p. 9.

employed at close-to-full capacity. Additionally, it is worth noting that the LAO's report was based on the most recent available data, which lags current enrollment.¹²⁶

Questions of institutional capacity, as well as of funding additional enrollment, present a complicated range of considerations. Yet, although demand for undergraduate enrollment is growing, the College Futures Foundation observes that at present, "the state has no explicit plans for accommodating these students, including guidelines for determining whether new capacity space will be needed, or where it might be needed."¹²⁷ Analysts and higher education experts have put forward a number of proposals for addressing issues of physical capacity and for constraining or addressing the cost of additional enrollment. These proposals include calls for "hybrid" campuses, partnerships between public and private institutions and greater use of online instruction and technology.

Community College Baccalaureates, Hybrid Campuses and Public-Private Partnerships

Various suggestions have been made over the years to creatively expand 4-year enrollments. The community college baccalaureate is one approach to increasing bachelor's attainment and has been widely adopted in other states. In 2014, SB 850 (Block) authorized 15 community college districts to introduce an applied bachelor's program on a pilot basis. These degrees potentially make 4-year degrees more convenient and accessible to place-bound students who seek an applied bachelor degree, with market demand. Some of the early results of the applied baccalaureate program are encouraging: community college presidents reported that initial graduating baccalaureate cohorts were securing well-paid positions and students enrolled in the programs also frequently describe themselves as place-bound, suggesting that these programs are indeed creating access as opposed to shifting students away from the traditional transfer path. The LAO's interim review of the program was, however, unable to draw conclusions about the financing of these programs, so the extent to which they might provide a more cost-effective path to a baccalaureate is unclear.¹²⁸

A more radical approach, suggested by Saul Geiser, a researcher at the Center for Studies in Higher Education at UC Berkeley, and Richard Atkinson, former president of the University of California, is for the state to explore "hybrid" institutions, including transforming some community college campuses into 2-year branch campuses of 4-year institutions. In this model, the branch campus is an integral part of the university, facilitating movement to the senior institution after two years since there is no need to transfer between distinct schools. Proponents of this approach suggest it could address some of the problems of student transfer while avoiding the costs associated with expanding 4-year campuses.¹²⁹ Undoubtedly, the administrative and political difficulties of creating hybrid campuses would be daunting; moreover, proposals to transfer campuses from one system to another may violate

¹²⁶ LAO, *Assessing UC and CSU Enrollment and Capacity*, p. 15.

¹²⁷ Patrick J. Lenz, *Paying for Space: A Brief Framing the Issues and Opportunities in Capital Finance for Higher Education in California* (San Francisco, CA: College Futures Foundation, 2017), p. 6.

¹²⁸ Patricia Gándara and Marcela Cuellar, *The Baccalaureate in the California Community College: Current Challenges & Future Prospects* (Los Angeles, CA: The Civil Rights Project, July 2016); LAO, *California Community Colleges: Interim Evaluation of Baccalaureate Degree Pilot Program* (Sacramento, CA: December 19, 2017).

¹²⁹ Geiser and Atkinson, "Beyond the Master Plan."

constitutional provisions that bar such conversions, and would need constitutional remedy.¹³⁰ Alternatively, Geiser and Atkinson suggest the university center model, wherein community colleges and 4-year institutions collaborate to allow students to complete upper-division coursework on the community college campus for a bachelor's degree that is awarded by the 4-year school.¹³¹

Other higher education leaders have emphasized opportunities in collaboration and partnerships between public and private, non-profit universities and colleges. Since private, non-profit institutions enroll a smaller percentage of students in California than they do in other states, their potential to help meet the state's higher educational needs has accordingly been overlooked. The challenges that independent institutions face are, however, often complementary to those confronting California's public colleges and universities. Many independent institutions, especially smaller schools, face declining enrollments while neighboring public institutions are impacted or struggle to accommodate rising enrollment.¹³² Creative collaborations may help to sustain independent institutions while allowing for increased enrollment in the public segments. A new collaboration between UC Berkeley and Mills College, a liberal arts school in Oakland, is one such example; this partnership allows a group of UC students to take some of their courses at Mills and to live in the college's residence halls, while giving Mills students access to particular UC Berkeley resources.¹³³

Several options exist for cross-segmental approaches to expanding enrollment and addressing issues of institutional capacity. Whatever the preferred path is to increasing community colleges' role in baccalaureate production (allowing more baccalaureate programs, forging deeper partnerships with 4-year institutions, or offering co-location of programs), it is clear that community colleges have the capacity to play a more significant role. Additionally, expanding cooperation between public and private, non-profit institutions can further enrich experiences for students, strengthen institutions and help address capital costs. How far such partnerships can be expanded or scaled should be explored.

Online Education

Researchers and higher education leaders have noted the potential for online education to expand accessibility and enrollment. California's institutions of higher education, especially community colleges and CSU, have substantially increased online instruction in recent years. CSU has adopted online education primarily as a means of reducing bottlenecks and encouraging completion; however, online instruction can also support greater enrollment, provide for greater sharing of instruction among campuses and reduce pressure on campus teaching and campus facilities. The California community

¹³⁰ 1946 California Constitutional Amendment: Section 6 of Article IX, <https://oac.cdlib.org/view?docId=hb6779p0vk;NAAN=13030&doc.view=frames&chunk.id=div00001&toc.depth=1&toc.id=div00001&brand=oac4>. Accessed 8-30-2018. This provision was added following the transfer of Santa Barbara State College to the University of California in 1944.

¹³¹ Geiser and Atkinson, "Beyond the Master Plan."

¹³² Total enrollment among private, non-profit universities has declined slightly statewide, from 281,000 FTE students in 2010-11 to 278,000 in 2015-16; individual campuses have suffered more substantial drops in enrollment.

¹³³ Carol T. Christ, "Small Liberal Arts Colleges and Enrollment Capacity at Public Universities: Imagining a Consortium Approach," CSHE Research and Occasional Paper Series, CSHE.2.16 (February 2015); "Berkeley-Mills Collaboration," <https://vcue.berkeley.edu/committees-initiatives/berkeley-mills>. Accessed 7-21-2018.

college system, for instance, has spent significant resources developing its California Virtual Campus - Online Education Initiative (CVC-OEI), which was developed on a common platform to support online course taking for students living anywhere in California. Currently, CVC-OEI highlights capacity and allows enrollment for online courses that are articulated throughout the system, and also provides student support for these courses.¹³⁴

Online courses can also expand higher education opportunities for non-traditional students, working adults and students living in locations without easy access to campus-based instruction. California Competes estimates that there are some 4.5 million Californians aged 25 to 64 who have some college credit but did not complete a degree, and observes that expanding California's highly educated workforce requires reaching out to this population and providing them with pathways to receiving degrees and certificates.¹³⁵ Expanded online education could help to establish such pathways.

Higher education analysts debate the potential of online education to reduce or contain the cost of higher education. Analysts generally agree that online education can help to address the substantial capital costs facing California's colleges and universities by reducing demand for physical classroom and campus space.¹³⁶ Online education also has potential to reduce the cost of instruction as online education allows individual courses to reach large numbers of students. However, the design and development of online courses and instructional material and technologies can require significant upfront investments.¹³⁷ There are examples, however, where online education has served to expand enrollment while controlling costs. Arizona State University, for instance, increased enrollment in the past decade in the face of cuts to state funding, partly by making greater use of online education.¹³⁸ Meanwhile, Western Governors University (WGU) has had success in utilizing the potential of exclusively online education to expand baccalaureate accessibility for working adults.¹³⁹

Higher education analysts and researchers increasingly see online education as an integral part of the solution to problems of higher education enrollment and cost.¹⁴⁰ Institutions offering online courses are developing approaches to course design and institutional support for students and faculty that contribute to student success in online courses. Adaptive learning technologies and interactive software

¹³⁴ The California Virtual Campus – Online Education Initiative, About the OEI, <https://cvc.edu/about-the-oei/>. Accessed 12-19-2018. LeBaron Woodyard and Erin Larson, *Distance Education Report: 2017 Report* (Sacramento, CA: California Community Colleges Chancellor's Office, 2017), pp. 13, 41, 56-7.

¹³⁵ Sebastian Castrechini, "Improving Data to Support Adult Learners," California Competes—Blog Posting (June 14, 2018), <http://californiacompetes.org/blog/improving-data-to-support-adult-learners>.

¹³⁶ LAO, *Assessing UC and CSU Enrollment and Capacity*; Lenz, *Paying for Space*.

¹³⁷ Hans Johnson and Marisol Cuellar Mejia, *Online Learning and Student Outcomes in California's Community Colleges* (San Francisco, CA: Public Policy Institute of California, May 2014).

¹³⁸ Michael M. Crow and William B. Dabars, *Designing the New American University* (Baltimore, MD: John Hopkins University Press, 2015); Jon Marcus, "Is Arizona State University the Model for the New American University," *The Hechinger Report* (March 11, 2015), <https://hechingerreport.org/is-arizona-state-university-the-model-for-the-new-american-university/>. Accessed 8-20-2018.

¹³⁹ Bok, *The Struggle to Reform Our Colleges*, pp. 91-2.

¹⁴⁰ McPherson and Bacow, "Online Higher Education: Beyond the Hype Cycle."

in online courses show promise as a means of enhancing educational attainment.¹⁴¹ In addition, studies of California community colleges suggest that students who take online courses may be more likely to earn their degree or transfer to a 4-year school; online education appears to have significant potential as a means to promote completion by eliminating bottlenecks and facilitating access to required courses, with a direct impact on institutional capacity to increase enrollment.¹⁴² Gaps in student performance between online and traditional courses, meanwhile, have narrowed. Across the California community college system, the gap in success rates between traditional and online courses more than halved between 2011-12 and 2016-17, from nine percentage points to four.¹⁴³ Wider adoption of online education may require legislative, segmental and institutional leadership in resolving the technological, pedagogical and administrative issues that have tended to hamper wider adoption of online learning at many institutions.

Completion

The focus of the Master Plan was on who got in, not on who got out. Neither the Plan nor early reviews gave much consideration to student outcomes following enrollment. Extremely low graduation rates in the 1990s began to change that focus. Concerns about the cost of higher education and a potential shortfall in college and university graduates have further encouraged greater attention to degree completion and timely graduation. PPIC identifies improved completion rates as the most significant source of increased bachelor's degree attainment in its projections for closing the degree gap.¹⁴⁴ Institutions of higher education have taken steps to enhance student preparation as one approach to improve retention and completion; early assessment, summer bridge programs and increased advising and counseling appear to have had a positive impact on student outcomes. Institutions have also taken steps to identify and remove barriers to student progress, like course bottlenecks, and have transformed their remediation and placement policies.

This increased focus on completion in the last decade has produced promising results. Four and six-year graduation rates at both UC and CSU are improving. In 1997, entering freshmen in UC had four and six-year graduation rates of approximately 45 and 80 percent. For the 2009 cohort, those rates were approximately 63 and 85 percent. The CSU Graduation Initiative 2015, launched in 2009, similarly appears to have contributed to improved outcomes in CSU. Four-year graduation rates for freshmen at CSU have improved from under 15 percent in 2000 to over 20 percent for the 2012 cohort. Six-year graduation rates improved from under 50 percent to about 60 percent between 2000 and 2010.¹⁴⁵ In 2015, CSU launched its Graduation Initiative 2025, with the goal of increasing 4-year graduation rates to

¹⁴¹ Hans Johnson, Marisol Cuellar Mejia, and Kevin Cook, *Successful Online Courses in California's Community Colleges* (San Francisco, CA: Public Policy Institute of California, June 2015).

¹⁴² Johnson and Cuellar Mejia, *Online Learning and Student Outcome in California's Community Colleges*.

¹⁴³ Woodyard and Larson, *Distance Education Report: 2017 Report*, p. 23.

¹⁴⁴ Johnson, *Higher Education in California: New Goals for the Master Plan*, pp. 12-13; Johnson, *Closing California's Workforce Skills Gap*, May 17, 2016 (Testimony by Hans Johnson before the Assembly Budget Subcommittee Number 2 on Education Finance), <http://www.ppic.org/blog/testimony-closing-californias-workforce-skills-gap/>. Accessed 8-24-2018.

¹⁴⁵ Jackson and Cook, *Improving College Graduation Rates: A Closer Look at California State University* (San Francisco, CA: Public Policy Institute of California, May 2016).

40 percent and 6-year graduation rates to 70 percent by 2025, as well as boosting the 2-year graduation rate for transfer students to 45 percent and the 4-year transfer graduation rate to 85 percent.

The community colleges' Student Success Initiative, meanwhile, has expanded counseling and advising services. Completion rates have not, as yet, reflected the impact of this program: the six-year completion rate for the most recent cohort (2010-11) is 48 percent, 1 percent lower than the completion rate for the 2006-07 cohort.¹⁴⁶ The Student Success Initiative was not, however, in place for the full enrollment of the most recent cohort and results are further complicated by students who obtain gainful employment without graduating. Rates of persistence have climbed since the introduction of the initiative.

Programs to support and encourage completion underscore a growing appreciation among higher education leadership of the importance of creating pathways to completion for students and providing support to keep them on those pathways (in fact, some leaders are exploring the promotion of 3-year degrees, in order to increase access and reduce costs for students and their families). Students at California's campuses today are often the first in their families to attend college. Some are English learners; many work and take classes part time. Recent research emphasizes the challenges that first-generation college students face in navigating university bureaucracies and degree pathways; students are too often unaware of counseling and financial aid resources. This work suggests the importance of counselors and intensive advisement in promoting student success.¹⁴⁷ For underrepresented students, social support networks, quality multicultural centers that provide support and community, and diverse faculty and mentors can help to create an environment more conducive to student success. With regard to student completion, the most important development of recent years may be the more student-centered perspective through which many higher education leaders now view both student progress and the relationship between student preparation and student success. In conversations community college administrators suggested that it is inadequate to ask simply, "are students ready for higher education?" Instead, it is necessary to ask: "are institutions of higher education ready for today's students;" and, "what is required for colleges to take students to a place where they can succeed?"

Eliminating Barriers to Completion

A central theme that emerged from conversations with stakeholders and review of literature regarding student progress is the importance of removing artificial barriers to student completion. Faculty and leadership in California's segments of higher education have identified existing approaches to remediation and placement as significant barriers to student advancement and completion. Recent changes in CSU's and CCC's approach to student placement, including the elimination of English and

¹⁴⁶ LAO, *The 2018-19 Budget: Higher Education Analysis*, pp. 4, 10.

¹⁴⁷ Estela Mara Bensimon and Alicia Down, "Dimensions of the Transfer Choice Gap: Experiences of Latina and Latino Students who Navigated Transfer Pathways," *Harvard Educational Review* 79, no. 4 (Winter 2009): 632-658; Lynn Ceresino Neault and William E. Piland, "Facing the Closed Door: What Community College Students Do After Being Denied Transfer Admission," *Community College Review* 42, no. 3(2014): 184-200; Kisker, Cohen and Waggoner, *Reforming Transfer and Articulation in California*; The Education Trust-West, *Hear My Voice: Strengthening the College Pipeline for Young Men of Color in California* (Oakland, CA: June 2017).

math placement tests and reforms to remediation are designed to alleviate these barriers.¹⁴⁸ Administrators emphasize, however, that there is still progress to be made on aligning curricular requirements with the actual skills students need in their future careers and on improving the transfer function.

In addition to eliminating unnecessary placement tests and providing students with additional support, research suggests additional strategies for increasing completion. These strategies include eliminating artificial barriers to completion (like course bottlenecks), facilitating transfers and creating clearer and more easily navigated curricular pathways to completion, including the use of technology tools that map those pathways. The CSU Graduation Initiative 2025 employs these strategies in order to encourage student progress. A recent survey of CSU students found that limited course availability was a leading reason that students were unable to graduate as quickly as they wanted. For 28 percent of students, inability to get into necessary courses prevented them from making timely progress.¹⁴⁹ CSU has identified bottlenecks and added faculty and courses in order to encourage student progress. The system has also introduced e-advising programs to help keep students on track for graduation, increased the availability of online courses and encouraged students to enroll in full-time course loads in order to place them on pathways to more timely graduation.

In addition to the Student Success Initiative, the community college system has introduced the California Guided Pathways Project. Higher education researchers observe that lack of clear degree pathways has hampered many students in their progress through higher education. Students who are unsure of what they plan to study take courses that ultimately do not contribute to their major; alternatively, without adequate and timely advising, students may not understand what courses and prerequisites they need to complete in order to progress in their desired field of study. The California Guided Pathways Project provides a framework that assists colleges in instituting structured educational experiences and coherent program maps, including clearly defined course sequences and progress milestones, to guide students to their degrees. Some colleges have substantially increased completion following the introduction of guided pathways. Los Angeles Trade & Technical College increased the award of degrees and certificates by 72 percent in three years, while enrollment remained static, by introducing academic pathways and integrating them with built-in student services and expanded academic counseling.¹⁵⁰

Although the CSU Graduation Initiatives, the community college Student Success Initiative and the California Guided Pathways Project all illustrate concentrated efforts on the part of segmental leadership to improve completion rates, analysts have noted opportunities for further improvement. Researchers observe that CSU campuses are implementing a variety of programs, including encouraging full-time enrollment, re-designing courses and improving advising, as part of the Graduation Initiative.

¹⁴⁸ LAO, *The 2018-19 Budget: Higher Education Analysis*. Olga Rodriguez, Marisol Cuellar Mejia and Hans Johnson, *Determining College Readiness in California's Community Colleges: A Survey of Assessment and Placement Policies* (San Francisco, CA: Public Policy Institute of California, November 2016); Gao and Johnson, *Improving College Pathways in California*.

¹⁴⁹ Moore and Tan, "Get Me from Point A to Point B," p. 11.

¹⁵⁰ Center for Urban Education, *Pathways, Partnerships, and Progress: Transforming a Community College* (Los Angeles: Center for Urban Education, Rossier School of Education, University of Southern California, 2017).

There is, however, still need for progress on integrating these efforts into coherent, systemic and campus-wide reform processes.¹⁵¹ In addition, although online education has significant potential as a means to facilitate completion by eliminating bottlenecks and facilitating access to required courses, the segments of public higher education have been relatively slow in fully developing online education's potential. CSU leadership has identified online education as a tool for improving graduation rates, but the LAO observes that students have been largely unaware that they can enroll in online courses at other campuses and the online course catalog is cumbersome. CSU has recently re-launched its intercampus online education program, potentially addressing this criticism.¹⁵² Meanwhile, although the California Virtual Campus – Online Education Initiative has established an online course exchange enabling students from participating colleges to take courses offered at other participating colleges, community college campuses have been slow to expand opportunities for cross-campus online enrollment out of concern that they would lose enrollment funding.¹⁵³

Transfer

In restricting first-year eligibility to the UC and CSU, the Master Plan placed considerable pressure on the performance of the transfer function to move students into 4-year institutions and maintain broad-based access to the baccalaureate degree. The Master Plan said little, however, about how transfer was to work in practice; it did not openly consider how the lack of coordination and articulation issues would factor in, or whether it was realistic to expect students, who might be less academically prepared, to study at less well-resourced institutions and then move seamlessly to 4-year campuses. Subsequent studies have suggested that students of comparable academic preparation are more likely to graduate with a bachelor's degree if they enter higher education at a 4-year campus rather than at a community college.¹⁵⁴

Reports have identified the weakness of the transfer function as a primary problem within the California system of higher education since the 1980s. Studies observe that the "decentralized, segmental structure" of California postsecondary education and the "strong tradition of local faculty autonomy over curriculum" complicate state-level planning for student transfer.¹⁵⁵ Students confront a confusing "transfer maze" of varying and shifting requirements that differ by campus and program—the Campaign for College Opportunity observed in 2017 that there were more than 110,000 articulation agreements between the UC and CCC campuses.¹⁵⁶ Recent efforts to improve community college outcomes and

¹⁵¹ Colleen Moore, Cynthia Schrager and Kathy Reeves Bracco, *From Scatterplot to Roadmap: New Efforts to Improve Student Success in the California State University* (Sacramento, CA: CSU Student Success Network, August 2017).

¹⁵² LAO, *The 2018-19 Budget: Higher Education Analysis*, p. 37; "CSU Students Can Now Take More Fully-Online Courses Every Term," (July 11, 2018), <https://www2.calstate.edu/csu-system/news/Pages/CSU-Students-Can-Now-Take-More-Fully-Online-Courses-Every-Term.aspx>. Accessed 8-29-2018.

¹⁵³ LAO, *The 2018-19 Budget: Higher Education Analysis*, p. 51.

¹⁵⁴ Geiser and Atkinson, "Beyond the Master Plan," pp. 11-12.

¹⁵⁵ Colleen Moore, Nancy Shulock and Cristy Jensen, *Crafting a Student-Centered Transfer Process in California: Lessons from Other States* (Sacramento, CA: Institute of Higher Education Leadership and Policy, August 2009), pp. i, 5-7.

¹⁵⁶ Campaign for College Opportunity, *The Transfer Maze: The High Cost to Students and the State of California* (Los Angeles and Sacramento, CA: September 2017), p. 26.

increase transfer appear, however, to be producing positive results, as evidenced by a record number of transfer admissions to UC in 2018, in which year UC admitted 28,750 transfer applicants, of whom 24,568 were California residents.¹⁵⁷

Since 1983, the California Legislature has passed a series of bills directing the segments to create a common course numbering system, enhance articulation of majors and to establish clear pathways for transfer. A listing of legislation suggests both the limits of legislative activity in the face of institutional barriers to change and how layers of policy-making have themselves complicated the transfer process:¹⁵⁸

- SB 851(Alquist)/Ch. 565 of 1983: Directed CPEC to develop a plan for a common course numbering system.
- AB 1725(Vasconcellos)/Ch. 973 of 1988: Directed the segments to develop common course numbering in general education courses for purposes of transfer.
- SB 121(Hart)/Ch. 1188 of 1991: Directed the segments to develop articulation agreements and transfer program agreements for all majors with lower division prerequisites.
- SB 450(Solis)/Ch. 493 of 1995: Required the Board of Governors to develop a common course numbering system for the CCC districts.
- SB 1415(Brulte)/Ch. 737 of 2004: Called for a common course numbering system for the 20 highest-demand majors in each segment.
- SB 1108(Committee on Judiciary)/Ch. 22 of 2005: Directed the CSU and CCCs to develop a lower division transfer curriculum for each high-demand baccalaureate degree and to articulate the courses for each major that meet transfer curriculum requirements.
- SB 652(Scott)/Ch. 804 of 2006: Requested the UC to address deficiencies in course articulation.
- AB 2302(Fong)/Ch. 427 of 2010: Requires the CSU and CCC to establish the most effective way to inform students about transfer pathways and requests the UC to continue to address deficiencies in course articulation.
- SB 1440(Padilla)/Ch. 428 of 2010: Requires community colleges to develop associate degrees for transfer (ADT) and requires the CSU to guarantee admission to ADT holders.
- SB 440(Padilla)/Ch. 720 of 2013: Requires CSU campuses to make every efforts to accept AD-Ts in all concentrations within the majors they offer and provides that the guarantee of admission for CC students includes admission to a program similar to that of their ADT.

¹⁵⁷ University of California Office of the President, "Press Release—UC Admission Rise, with Record Surge in Transfers," <https://www.universityofcalifornia.edu/press-room/uc-admissions-rise-record-surge-transfers>. Accessed 12-18-2018.

¹⁵⁸ Colleen Moore and Nancy Shulock, *From Community College to University: Expectations for California's New Transfer Degrees* (San Francisco, CA: Public Policy Institute of California, March 2014), p. 6. For a full summary of transfer initiative, see Moore, Shulock and Jensen, *Crafting a Student-Centered Transfer Process in California*, Table 4.

The new associate degree for transfer shows promise as a means of clarifying and expediting transfer for students.¹⁵⁹ In 2015, the LAO reported significant progress in the implementation of the degree on many CCC and CSU campuses.¹⁶⁰ Nearly half of ADT students complete their bachelor's degree within two years, in comparison to 27 percent of traditional transfer students.¹⁶¹ The recent agreement between UC and the community college system to create new transfer pathways with a guarantee of admission to the UC system should encourage a more coherent transfer process between those segments.¹⁶² The community colleges have also partnered with the Association of Independent California Colleges and Universities to expand the ADT pathway program to 36 private non-profit universities.¹⁶³

Community college and 4-year campuses have also entered into a variety of imaginative partnerships to provide streamlined transfer opportunities. In some cases, schools have collaborated to provide more convenient geographical access to higher educational opportunities. CSU San Marcos and Mt. San Jacinto College, for instance, have partnered to offer a guaranteed transfer pathway at a joint educational facility in Temecula.¹⁶⁴ In other cases, community colleges and 4-year institutions work together to allow students to complete transfer and BA requirements on a single campus. UC Davis, for instance, hosts a Sacramento City College center on its campus.

Evaluating and Sustaining Enrollment and Completion

In the course of the review, higher education stakeholders and researchers regularly made two points with regard to California's system of higher education. First, they emphasized the deficiencies of current data collection for understanding student progress through the educational system and urged the creation of a statewide comprehensive data system to monitor students from the beginning of their education through their entry into the workforce. Second, they asked, "how do we shield our students from the boom and bust cycle of higher education finance?" Without addressing long-standing problems of data collection and education finance, it may be difficult to judge the effectiveness of cross-segmental strategies for increasing enrollment and completion or to protect gains in enrollment during the next economic downturn.

¹⁵⁹ Darla M. Cooper, et al. *Through the Gate: Mapping the Transfer Landscape for California Community College Students* (San Rafael, CA: The RP Group, November 2017).

¹⁶⁰ LAO, *Implementation Update: Reforming Transfer From CCC to CSU* (Sacramento, CA: February 2, 2015).

¹⁶¹ Campaign for College Opportunity, *The Transfer Maze*, p. 2.

¹⁶² "UC and CCC Sign Agreement to Boost Transfers, Increase Academic Preparation," April 11, 2018, <https://www.universityofcalifornia.edu/press-room/uc-and-ccc-sign-agreement-boost-transfers-increase-academic-preparation>. Accessed 8-30-2018.

¹⁶³ California Community Colleges Chancellor's Office, "New California Colleges Agreement with Private Colleges and Universities Marks Major Expansion of Associate Degree for Transfer Program," (July 25, 2018), <http://www.californiacommunitycolleges.cccco.edu/Portals/0/DocDownloads/PressReleases/JULY2018/PR-ADT-AICCU-MOU-7-25-2018.pdf>.

¹⁶⁴ Paul Fain, "Two-Plus-Two in Temecula," *Inside HigherEd* (July 30, 2015), <https://www.insidehighered.com/news/2015/07/30/csu-san-marcos-and-mt-san-jacinto-college-travel-team-joint-degree-program>. Accessed 7-22-2018.

A Comprehensive System of Data Collection

A chief recommendation from higher education researchers and experts is the creation of a comprehensive data system to track the progress of California students from K-12 through higher education and into the workforce. California's institutions of secondary and postsecondary education collect copious amounts of data, but this data is generally not linked; the data sharing that takes place is often voluntary and covers only a portion of students and educational institutions.¹⁶⁵ Researchers and experts highlight that California is an outlier in its lack of such a system. Forty-three states have or are developing comprehensive data systems that link K-12 and postsecondary data; thirty-three of these state systems further link education and workforce data.¹⁶⁶

The lack of a comprehensive education data system impedes the ability of policymakers and researchers to track the movement of students across the sectors of California's education system. School districts generally do not have information about what happens to their students after those students enroll in higher education. As a result, it is difficult for districts to determine which strategies designed to enhance readiness for higher education are most effective. A fragmented data system also hampers administrators and researchers' ability to evaluate the actual progress of students in higher education. Researchers know that many students do not follow traditional transfer pathways from community college to 4-year institutions, but rather "swirl" among institutions. Are students dropping out of higher education or moving to a different institution? How does movement among institutions affect student outcomes? For-profit institutions and training programs, meanwhile, tend to be a data mystery, with branch-level information for for-profit institutions going unreported.¹⁶⁷

Advocates for a comprehensive data system emphasize the possibilities it would provide.¹⁶⁸ It would allow policymakers and administrators to evaluate the effectiveness of different strategies for creating pathways from K-12 to higher education. It would enable California and institutions of higher education to identify older adults who have completed higher education credits without obtaining a degree. If linked to workforce and salary data—the community college system and University of California have both already created websites that link salary data to different areas of study—such a system would also give prospective students more information in deciding where and what to study.

There are, however, also notable obstacles to the creation of a statewide educational data system. Institutions and segments define data elements—including ethnicity and course types—differently. There is no common student identification number in use across California's systems of education. A recent feasibility study that examined whether student course data contained in CALPADS could be used to determine whether students had completed A-G requirements for UC/CSU eligibility underscores

¹⁶⁵ Colleen Moore, Kathy Reeves Bracco and Thad Nodine, *California's Maze of Student Information: Education Data Systems Leave Critical Questions Unanswered* (Sacramento, CA: Education Insights Center, August 2017), pp. 5-9.

¹⁶⁶ California Competes, *Out of the Dark: Bringing California's Education Data into the 21st Century* (Oakland, CA, May 2018).

¹⁶⁷ Moore, et al, *California's Maze of Student Information*; Scott and Kirst, *Higher Education and Silicon Valley*.

¹⁶⁸ Jacob Jackson and Kevin Cook, *Modernizing California's Education Data System* (San Francisco, CA: Public Policy Institute of California, November 2018).

these challenges. The authors of the report were optimistic for the potential of using CALPADS data for the purposes of eligibility studies, but observed that changes in how course data is entered into CALPADS data would be necessary before CALPADS data could be reliably used to determine UC/CSU eligibility.¹⁶⁹ The creation of a comprehensive data system thus goes beyond aggregating data. In order for the data to be fully comparable, it ultimately requires cross-segmental and inter-institutional agreement about which data points are desired and for what ends. Policymakers may wish to consider how fully the benefits of a comprehensive system of student data collection outweigh the costs that would be associated with the collection, synthesizing and processing of this data.

Funding Higher Education

The original Master Plan was largely silent on the question of higher education finance. The architects of the plan were confident that they could depend on the state to carry the brunt of education spending. In the last three decades, repeated budget crises have led analysts of California higher education to confront head on questions of finance.

Three broad developments have altered the basic understanding of higher education cost and finance:

First, since the 1990s, studies and reports have pointed to the “boom and bust” cycles of California higher education finance as a source of instability in higher education funding.¹⁷⁰ The California Citizens Commission in 1999 observed that California urgently needed to confront “the impossibly high cost of accommodating” new enrollments “under ‘business as usual’ and the destructive ‘boom and bust’ cycles of state finance.”¹⁷¹ The Commission quoted RAND’s Council for Aid to Education on the harmful systemic effects of this cyclical pattern: “[i]n good times, because resources are readily available, there is no incentive to pursue efficiency. [I]n bad times, institutions adopt short-term measures to shrink services and drive up tuition to ride out the storm.”¹⁷² Studies advise revenue smoothing, with steady increases in general fund support and in contingency reserves, as well as gradual and predictable increases in tuition and need-based aid, as means to break the boom and bust cycle.¹⁷³

Second, there is growing support for rethinking how higher education finance can be used to encourage desired student outcomes. The 2013 Little Hoover Commission review of the Master Plan proposed linking some funding to targeted goals.¹⁷⁴ The state also recently enacted the gradual introduction of a performance funding formula for the community college system. Although evidence for performance based funding is mixed, there is optimism that a carefully managed system of performance funding can

¹⁶⁹ Anthony Fong, Vanessa Barrat and Neal Finkelstein, *Examination of Data Usability Options for Assessing Eligibility for Higher Education in California* (San Francisco, CA: WestEd, 2018).

¹⁷⁰ Breneman, *The Challenge Facing California Higher Education*, p. 7; Joint Committee to Develop a Master Plan for Education, *The California Master Plan for Education* (Sacramento, CA: California Legislature, 2002), p. 6; College Futures Foundation, *Securing the Public Trust*, pp. 17-8.

¹⁷¹ California Citizens Commission, *Toward A State of Learning*, p. 20.

¹⁷² Roger Benjamin and Stephen Carroll, *Breaking the Social Contract: The Fiscal Crisis in California Higher Education* (Santa Monica, CA: RAND, Council for Aid to Education, 2002), p. 22.

¹⁷³ California Citizens Commission, *Toward A State of Learning*, pp. 37-41; College Futures Foundation, *Securing Public Trust*, p. 27.

¹⁷⁴ Little Hoover Commission, *A New Plan for A New Economy*, pp. 47-9.

encourage institutions to direct or reallocate resources to encourage student progress and completion.¹⁷⁵

Third, recent reports have also expanded analysis of higher education costs beyond questions of how much is spent to include consideration of the institutional structures that determine how and where money is spent. The cost patterns of universities and colleges are not, the College Futures Foundation observes, “dictated by the laws of physics;” instead, “they are a function of institutional policies and faculty preferences about teaching loads and time and the linking of costs between undergraduate and graduate education.”¹⁷⁶ In addition, spending for employee benefits at UC and CSU has risen from 25 percent to between 43 and 48 percent of total compensation since 1978. In comparison to the early days of the Master Plan, the ability of institutions of higher education to serve their students is constrained both by relative reductions in per student state support and inflexible cost structures that prevent institutions from reallocating funds to promote access and success. College Futures encourages greater transparency in higher education finance to allow “all parties to understand the costs and the tradeoffs associated” with different spending options and recommends greater alignment between cost structures and state educational priorities.¹⁷⁷ College Futures also suggests the creation of a state fund for “higher education renewal” to support greater efficiency and effectiveness in the use of resources.¹⁷⁸

Two cost areas may pose particular challenges for addressing cost structures:

- Research is an integral and vital portion of the University of California mission, and one which conveys substantial economic and social benefits and contributes to the intellectual vibrancy of UC campuses and their communities. It also substantially increases the cost of education: lower teaching loads prevail at research universities compared to teaching-intensive institutions; faculty salaries tend to rise with higher research intensity; and university research activity brings with it costly graduate education. College Futures estimates that approximately a quarter of funding obtained through state subsidies and tuition at the undergraduate level at the UC goes to support graduate education.¹⁷⁹ The priorities of research, graduate education and undergraduate education are tightly intertwined. Greater transparency might allow for a more informed discussion as to trade-offs, costs and benefits of this cost structure.
- Higher education cost structures and finance are also constrained by the aging of the Master Plan’s physical infrastructure and the demand for more environmentally sustainable, technologically enhanced, seismically sound structures and sophisticated labs. The estimated capital spending

¹⁷⁵ Patrick Murphy, et al., *Higher Education in California: Performance Budgeting* (San Francisco, CA: Public Policy Institute of California, November 2014).

¹⁷⁶ College Futures Foundation, *Securing the Public Trust*, p. 21.

¹⁷⁷ The PPIC recommends institutional cost-per-degree as a useful metric to frame discussions regarding cost and outcomes in higher education. This approach, however, would not necessarily enhance transparency in higher education spending. Compare College Futures Foundation, *Securing the Public Trust* and Hans Johnson, et al., *Higher Education in California: Institutional Costs* (San Francisco, CA: Public Policy Institute of California, November 2014).

¹⁷⁸ College Futures Foundation, *Securing the Public Trust*, p. 28.

¹⁷⁹ Ibid., p. 21.

needs for California's public segments of higher education are enormous. The UC, CSU and CCC systems estimated in 2017 that they would need \$47.2 billion over the next five years to address facility needs, including the construction of new facilities to accommodate enrollment growth and the modernization of existing structures. In addition, the CCC system estimated a need for \$200 million annually in deferred maintenance; CSU and UC have estimated deferred maintenance backlogs of \$2.6 billion and of between \$3.2 and \$5 billion, respectively.¹⁸⁰ Experts in higher education finance and budgeting observe that capital outlays for colleges and universities have traditionally been considered separately from operating budgets and not factored into the costs of higher education. Some experts suggest that addressing the capital funding needs of California's system of higher education will require a planning and budgeting process that integrates capital and operating needs and a process to rationalize capital spending priorities.¹⁸¹ Others are concerned that unless funded separately, capital needs will continue to be underfunded, resulting in ongoing neglect and capacity issues.

Re-Skilling Opportunities for Adults

As a document focused on providing a traditional education to traditional students, the 1960 Master Plan said little about continuing education.¹⁸² The prevailing assumption was that when graduates started a job, they were beginning a career that would extend for their working lives. Subsequent reports addressed changing economic contexts. The 1972 Select Committee report opined, "[e]ducation for citizens beyond the traditional college-age group may become the most important single challenge for public higher education through the remainder of this century."¹⁸³ The 1973 Joint Committee report precociously proposed a fourth public segment, the California Cooperative University, to coordinate efforts of the segments in extended learning, provide its own programs and develop "methods of recognizing achievement on the basis of experiential learning and equivalency tests."¹⁸⁴ Yet these recommendations did little to establish continuing education as an integral and equal function of higher education.

Today, education experts point toward an educational future where graduation with a degree or certificate will be only a starting point towards a life of continuous education, training and re-skilling. During the review, faculty and administrators repeatedly emphasized that students are likely to change careers multiple times over the course of their lives. Near constant training is already an increasingly essential part of particular career paths. Silicon Valley contract workers, for example, must regularly retrain to remain up-to-date on coding languages. Meanwhile, even at a time of robust economic performance and low unemployment, there are currently about half a million involuntary job

¹⁸⁰ Lenz, *Paying for Space*, p. 5.

¹⁸¹ Ibid., p. 4

¹⁸² This report distinguishes adult education, as referring to basic skills learning for adult learners, from continuing education, which here includes different forms of re-skilling and workforce training, as well as higher education learning by adult learners.

¹⁸³ *The California Master Plan for Higher Education in the Seventies and Beyond* (1972), pp. 17, 105.

¹⁸⁴ *Report of the Joint Committee on the Master Plan for Higher Education* (1973), pp. 57-8.

separations in California every month; in 2012, when California was still climbing out of recession, that number was over a million.¹⁸⁵

California has taken steps to strengthen the provision of life-long learning and address the needs of adults seeking continuing education for re-skilling and career purposes. In 2013, California began restructuring its system of adult education; adult education providers, including school and community college districts and county offices of education, have formed regional consortia, supported by the Adult Education Block Grant, to coordinate and deliver adult education, workforce preparation for adults and career technical education. In addition to the re-skilling opportunities that the community college system provides, the new online community college aims to connect adult learners with opportunities to re-skill or to earn certificates that will allow them to progress in their careers. It also aims to meet the needs of workers who are effectively stranded from traditional education by virtue of working full time or living far from campuses.¹⁸⁶ In addition, the formal public workforce system, overseen by the California Workforce Development Board, provides federal funds for job training through the Workforce Innovation and Opportunity Act (2014), maintains One-Stop Career Centers that provide employment and training services and offers training programs for unemployed and disadvantaged Californians.¹⁸⁷

The formal system of workforce development and retraining is, however, only part of a broader ecosystem of continuing and life-long education in California. In 2015-16, UC Extension enrolled over 400,000 students, divided almost evenly between students in professional noncredit and general noncredit courses and students in professional credit or degree credit programs.¹⁸⁸ CSU Extension reports enrollments of about 300,000 students.¹⁸⁹ Meanwhile, an increasingly large number of undergraduate students at CSU are adult learners.¹⁹⁰ In fall 2017, about 75,000 undergraduates enrolled in the CSU system were over 25 years of age; although many of these students entered CSU as traditional aged students, they suggest a blurring of traditional and continuing education.¹⁹¹ Finally, independent colleges and universities and for-profit institutions also offer an array of programs aimed at providing re-skilling, continuing education and training for adults.

Would-be students interested in learning new skills or acquiring new credentials face a smorgasbord of options and a complex matrix of decisions. They must choose whether to take a program offered by a community college, a public or private university extension program, the online branch of a national

¹⁸⁵ California State Economic Development Department, *California Labor Market Review* (June 2018).

¹⁸⁶ California Competes, *Wanted: Social and Economic Mobility for California's Stranded Workers* (Oakland, CA: 2018).

¹⁸⁷ California Workforce Development Board, *Skills Attainment for Upward Mobility; Aligned Services for Shared Prosperity: California's Unified Strategic Workforce Development Plan Under the Workforce Innovation and Opportunity Act (WIOA) for Program Years 2016-2019* (Sacramento, CA: 2016).

¹⁸⁸ University of California Institutional Research and Academic Planning Unit, *Annual Accountability Report* (Oakland, CA: University of California Office of the President, 2017), p. 132.

¹⁸⁹ California State University, Extended & Continuing Education, "About Extended Education," <https://www.calstate.edu/extension/about/>. Accessed 8-27-2018.

¹⁹⁰ Data from IPEDS.

¹⁹¹ CSU Institutional Research and Analyses, Statistical Reports 2017-2018, CSU Enrollment by Age, Sex, and Student Level, Fall 2017 Profile, http://www.calstate.edu/as/stat_reports/2017-2018/f_age17toc.shtml.

non-profit university, or a for-profit provider or institution. They must choose from an array of different certificate and credential options, including stackable credentials, nanodegrees, alternative digital credentials (digital badges) and “bootcamps,” not to mention traditional degrees, while having few tools to determine how these different options compare to one another and little information with which to judge their actual career or economic value.¹⁹² Workforce development funding for displaced and disadvantaged workers is available for some programs, Pell or Cal Grant aid for others. The student will be able articulate credits from some programs, but not others, towards a degree and those credits may be accepted by some institutions but not others. The result is a minefield for workers where a misstep can lead to high levels of debt and a credential that carries little or no economic value;¹⁹³ or it can result in uncertainty that causes delay in pursuing the education needed for higher wages or greater professional success.

Although there is considerable academic and public discussion about the importance of re-skilling and life-long learning, a commitment to addressing the deficiencies of the existing system of continuing education is unequally shared. As one education expert observed, despite current rhetoric about individuals changing jobs and careers frequently through their lives, tenured faculty are substantially insulated from the churn and uncertainty that will confront their students. “Educating undergraduates, preparing graduate students, and creating new knowledge by conducting research are seen as the real, serious endeavors of the university, while life-long learning is viewed as ancillary.”¹⁹⁴ The UC and CSU Extension schools are, in practice, junior partners within those segments.¹⁹⁵

A Master Plan for Continuing Education?

The absence of cross-segmental planning around continuing education and re-skilling presents an opportunity. Continuing education exists outside the Master Plan and its “treaties.” As a result, continuing education presents a potential opportunity to collaborate and coordinate more fully than is often possible with traditional education. In the course of the review, researchers and administrators suggested that the state and its diverse institutions of higher education may wish to explore creating a framework for a more coordinated and more easily navigated system of life-long learning and re-skilling.

Creating a more coordinated system of continuous education and of re-skilling would entail thinking systematically about how diverse institutions today provide training and continuous education for adults. As noted above, these institutions include: the community colleges and the new online community college; the CSU and UC campuses, through their substantial extension programs; non-profit universities, including institutions like National University and Western Governors University that primarily serve adult learners; and an array of for-profit providers and institutions that range from major

¹⁹² Kirst, “Policy Perspectives,” pp. 221-3.

¹⁹³ Mary Alice McCarthy, *Beyond the Skills Gap: Making Education Work for Students, Employers, and Communities* (Washington, DC: New America Foundation, October 2014).

¹⁹⁴ Aoun, *Robot-Proof*, p. 117.

¹⁹⁵ The 1972 Select Committee on the Master Plan for Higher Education report observed, “Historically, continuing higher education has been given second-class status in programs, fees, and policies for students by institutions and by State policy.” This situation remain similar today. *The California Master Plan for Higher Education in the Seventies and Beyond* (1972), p. 54.

national institutions to local vocational schools to bootcamps. It would require significant leadership to encourage these institutions to collaborate and cooperate in the provision of training and education for adults seeking re-skilling. Such collaboration could, however, provide Californians with a more navigable path to opportunities for re-skilling. It could also provide a basis for addressing, improving or institutionalizing the range of new credentials, like nanodegrees and digital badges, that seek to certify student skills in a 21st century workforce environment.

A basic question for policymakers to consider in promoting better coordination of re-skilling opportunities for adults is the level of partnership to encourage among public and non-profit institutions of higher education and for-profit colleges and universities. As noted above, enrollment at for-profit institutions of higher education has expanded as these institutions responded to demand for training opportunities that often went unmet by public institutions. Yet for-profit institutions are also controversial. Many critics of for-profit colleges suggest these institutions have often provided students with credentials that are of no more or of less economic value than those from community colleges and non-selective institutions, at far greater cost.¹⁹⁶ In 2012, a congressional investigation found that 57 percent of students at for-profit institutions left college with more than \$30,000 of student debt, compared to 25 percent of students at non-profit private schools and 12 percent of students from public institutions.¹⁹⁷ A more coordinated approach to re-skilling could provide opportunities to identify which for-profit institutions best serve their students. It could also help broaden provision of career training through non-profit and public institutions and potentially reduce the attractiveness of for-profit providers with poor track records.

Experts on continuing education identified several key features for a more coherent and integrated statewide system of adult learning and re-skilling. First, it would recognize the academic value of students' real world and workforce-based experiences. Adult students bring with them valuable life skills and workforce-based experiences; educators are, however, uncertain how to credit such experiential learning.¹⁹⁸ The traditional measure of academic learning, the Carnegie Unit or "credit hour," is a measure of instructional time, not of learning attainment.¹⁹⁹ Today, educational institutions and organizations have begun exploring and developing metrics to reflect learning, as opposed to seat time. The Lumina Foundation, for example, has developed a degree qualification profile as a framework for understanding postgraduate degrees in terms of learning outcomes; Western Governors University, meanwhile, links "competency units" to a credit-hour system.²⁰⁰ California's institutions of higher

¹⁹⁶ Bok, *The Struggle to Reform Our Colleges*, p. 87.

¹⁹⁷ W. Richard Scott et al., "Diverse Colleges in Varied Sub-Regions," in Scott and Kirst, *Higher Education and Silicon Valley*, p. 156.

¹⁹⁸ Corporation for a Skilled Workforce, *Making a Market for Competency-Based Credentials* (Ann Arbor, MI: October 2013).

¹⁹⁹ Elena Silva, Taylor White and Thomas Toch, *The Carnegie Unit: A Century-Old Standard in a Changing Education Landscape* (Stanford, CA: Carnegie Foundation for the Advancement of Teaching, January 2015).

²⁰⁰ Cliff Adelman et al., *The Degree Qualifications Profile: A Learning-Centered Framework for what College Graduates Should Know and Be Able To Do To Earn the Associate, Bachelor's or Master's Degree* (Indianapolis, IN: Lumina Foundation, October 2014).

education may wish to develop common approaches and metrics to honor adult students' experiential learning.

Second, students would need to be able to transfer academic credits (including credits earned based on experiential learning) among programs and institutions of continuing education and, ideally, back to traditional programs. They should then be able to track these credits through a shared transcript, such as through an "education passport," which would document and verify learners' progress through courses and programs at different institutions and provide a verified record of students' demonstrated skills and achievement.²⁰¹ They should also, as much as possible, be able to stack certificates and credentials from different institutions and programs. Third, a more systematic approach to life-long learning would promote broader collection and reporting of data to enable students to make informed choices. Finally, the creation of a coordinated system of adult education might necessitate a rethinking of state financial aid policies for adult learners.

Aligning Higher Education and Regional Economies

As Scott and Kirst describe the relationship between higher education and Silicon Valley, colleges and universities and regional economies are "connected but conflicted." Institutions of higher education are key players in regional economies. They produce graduates who occupy regional jobs, they employ thousands of local workers and they inject considerable sums into regional economies. Faculty and students at universities provide both basic and more tailored research that feed into the operations and advancement of regional industries. Close alignment of higher education with regional economic and workforce needs is, however, generally fragmented and limited. The community college Strong Workforce Program responds to local demand for skilled workers but concentrates on providing career and technical training for middle-skill jobs. California's Unified Strategic Workforce Development Plan, developed under the Workforce Investment and Opportunity Act, similarly emphasizes regional coordination and focuses on middle-skill jobs and on populations with barriers to employment.²⁰² The state lacks regional bodies with sustained funding that can coordinate diverse institutions of higher education, public and private, 2- and 4-year, with a full array of economic and community stakeholders.

The rate of economic change, meanwhile, outpaces the ability of colleges and universities to adapt. A former president of a Bay Area state university summarized the challenge facing public institutions of higher education when he observed, "the regional economy changes exponentially, but my university can only change incrementally."²⁰³ The process of creating and revising courses and programs lags behind changing economic demands.²⁰⁴ As a CPEC paper observed, "the linkage between higher education and workforce demands is weak. Funding and resource allocation are generally based on factors internal to the institution or system such as faculty, enrollment demand, or grant dollars and are

²⁰¹ Kirst, "Policy Perspectives," p. 222.

²⁰² California Workforce Development Board, *Skills Attainment for Upward Mobility; Aligned Services for Shared Prosperity: California's Unified Strategic Workforce Development Plan*.

²⁰³ W. Richard Scott et al., "Introduction," in Scott and Kirst, *Higher Education and Silicon Valley*, p. 5.

²⁰⁴ Scott, "Diverse Colleges in Varied Sub-Regions," pp. 164-5.

often informed only at the margins by labor demand.”²⁰⁵ Links between higher education and companies and employers, moreover, often depend on the efforts and networks of individuals, precisely because they are not institutionally systematized.

Some would argue that this is, in large part, as is should be. Universities are “preservative” institutions that serve a number of purposes other than preparing graduates for the workforce. They aim to prepare students for citizenship and critical thinking—constants in an ever-changing, complicated, multicultural world. They act as centers of cultural expression and they provide vibrant civic spaces.

The distance between institutions of higher education and the local economy is, nevertheless, far greater than it needs to be. This misalignment takes different forms. Institutions of higher education do not produce enough graduates in key fields, especially STEM fields, that are in demand among California’s employers and vital to the state’s economy. Scott and Kirst, meanwhile, observe that institutions may maintain programs that are out of sync with local demand and are sometimes slow to replace them with programs teaching current skills.²⁰⁶ Levels of collaboration with companies and industry stakeholders differ considerably among institutions and departments; STEM departments and professional schools often have advisory boards that provide points of contact for local companies, but these are less common in other departments and schools.²⁰⁷ Too few departments seem to prepare students for the workforce with real intention. In this, they fail to respond to the fact that today’s students are deeply concerned with finding a job and establishing a career after they graduate. One higher education administrator observed that many students do not have the “luxury of finding themselves”—they need jobs.

Faculty, administrators and higher education experts emphasized that it is not necessary to make a sharp distinction between workforce readiness and the traditional goals of higher education; the relationship between general education and career preparation is not one of “either/or.” In fact, meeting workforce needs does not mean narrowly tailoring higher education to professional demands. The 21st century skills that employers want—critical thinking, analytical ability, cultural awareness, empathy, effective communication in speaking and writing, capacity to work in teams—are not skills suited to only one career field. Since jobs of the future are likely to be different from the jobs of today, students need to “learn how to learn” as well as learn specific skills. Nevertheless, in order to facilitate student movement into the workforce and to help make good job opportunities available for all students, institutions of higher education, can do more to link the education they provide with the career goals of their students and with the needs of regional economies, whether it is through contextualized learning, providing greater insight into what it is like to work in a career field, or aligning supply of majors and courses with student and regional demand.

²⁰⁵ California Postsecondary Education Commission, *Developing a System to Compare Degree Production with Labor Market Demand* (Working Paper WP/05-03), September 2005.

²⁰⁶ Scott, “Diverse Colleges in Varied Sub-Regions,” pp. 159, 164-165.

²⁰⁷ W. Richard Scott et al., “Structures and Strategies for Adaptation,” in Scott and Kirst, *Higher Education and Silicon Valley*, pp. 188-9.

Bridges between Higher Education and Regional Economies

Researchers emphasize the importance of establishing connections and points of contact between higher education and regional economic partners. Such regional integration is greatest at the community college level; the vocational mission of the community college system has provided for coordination between colleges and workforce development agencies and industry and labor groups. Community college presidents often sit on regional workforce development boards and academic departments partner with industry and labor to meet specific training needs.

Conversations with administrators and faculty suggest that UC and CSU campuses can adopt the spirit, if not the specific mechanics, of these collaborations between community colleges and regional economic partners. In 2017, AB 957 (Levine) directed the CSU and UC to participate in regional conversations regarding workforce development in order to promote greater regional workforce and higher education coordination. This legislation also included the chief executive officers of the CSU and UC systems and of their individual campuses as individuals permitted to sit on the California Workforce Development Board. Broader participation of campus leaders in conversations regarding regional workforce development may help to reveal opportunities for collaboration and cooperation. At an institutional level, segmental and campus leadership could encourage the creation of advisory boards in departments and schools where they do not currently exist. Such boards could help connect education in non-professional departments more closely to student career goals. They could also provide advice on developing concrete approaches to helping students understand how to connect classroom learning to job skills.

More broadly, there is emerging recognition of the need for regional entities that can coordinate California's diverse array of institutions of higher education, both public and private, and provide a nexus for collaboration with economic and community stakeholders. Scott and Kirst suggest guidelines for imagining such a regional coordinating entity for the San Francisco Bay Area. They specify that it would include representatives from the leadership of K-12 and higher education, as well as from the leadership of business and industry, labor and government. Its aim would be to "establish a strategic vision" for K-12 and higher education in the region and provide coordination to facilitate student entry into and movement between educational institutions. It would also provide a single point of contact for communication between higher education, regional employers and labor about workforce needs and levels of student preparation.²⁰⁸

CTE Career Pathways

The community college system has recently taken significant steps to enhance regional alignment of higher education and workforce needs at the level of career technical education (CTE). The community college Strong Workforce Program, which dates to 2016, seeks to address California's skills gap by providing degrees and certificates for one million additional middle-skill workers. The program rests on collaboration with local industry and workforce development boards and responds to demonstrated demand for skills and training. Moreover, through the Doing What Matters for Jobs and the Economy

²⁰⁸ Kirst, "Policy Perspectives," pp. 233-7.

framework, the community college system has adopted an explicitly regional approach to addressing California's workforce needs.

These initiatives represent a significant reengagement with workforce alignment on the part of California's community colleges. Although the Master Plan specified that vocational education was one of the principal missions of community colleges, some researchers observe that more attention has traditionally been given to community colleges' transfer function than to career technical education.²⁰⁹ CTE programs tend to be more expensive than programs in the liberal arts and sciences that are oriented towards transfer and have presented ongoing challenges in recruiting qualified faculty; in the past, these programs were also often seen as less prestigious than those programs that prepared students for transfer. As a result, colleges often failed to maintain or sustain these programs and, in times of tight budgets, tended to cut them first. This situation, however, has changed. Infusions of state funding have put CTE programs on a stronger footing. Growing demand for workers prepared for middle-skill jobs has led to the development of CTE programs providing industry-valued degrees and credentials in fields like biotechnology, advanced manufacturing, healthcare and information and communications technology. That education also focuses on providing students with broader 21st century skills, as well as technical training. The community college system is currently working to change outdated perceptions of vocational and career technical education by rebranding it as "career education."²¹⁰

CTE programs offer significant career opportunities for students while meeting workforce needs. A valid criticism of vocational and career technical education lies, of course, in the potential of such education to fall along and reaffirm social divisions. There is "no reasonable argument why a bachelor's degree should be more accessible to white and Asian students, while technical and vocational certificates are good enough for African American and Latino students."²¹¹ To avoid this inequity, increased opportunities for career technical education must come alongside greater university accessibility. Yet if career technical education should not be the only choice for any students, it is not a lesser component of higher education and should not be a second choice for students either.²¹² Although wage-premiums for middle-skill jobs vary considerably, there are careers, like working as registered nurses, radiologic technologists or web developers, accessible via CTE degrees and industry certificates for which average salaries are higher than the average salaries for the holders of baccalaureate degrees in many areas of study.²¹³ Helping students and the broader public to understand the potential of CTE programs to

²⁰⁹ Nancy Shulock, Colleen Moore and Jeremy Offenstein, *The Road Less Traveled: Realizing the Potential of Career Technical Education in California Community Colleges* (Sacramento, CA: Institute for Higher Education Leadership and Policy, February 2011).

²¹⁰ California Community Colleges Doing What Matters for Jobs and the Economy, "CTE/CE Rebranding Campaign," <https://doingwhatmatters.cccco.edu/ForCareerEducationFaculty/CTERebranding.aspx>. Accessed 8-24-2018.

²¹¹ College Futures Foundation, *Securing the Public Trust*, p. 8.

²¹² McCarthy, *Beyond the Skills Gap*.

²¹³ Sarah Bohn, *California's Need for Skilled Workers* (San Francisco, CA: Public Policy Institute of California, September 2014); Paul Fain, "Helping Career Education Become a First Choice," *Inside HigherEd* (July 5, 2017), <https://www.insidehighered.com/news/2017/07/05/california-community-colleges-seek-rebrand-cte-state-kicks-new-money>.

prepare students for high-paying jobs in today's economy and the difference between contemporary CTE and traditional vocational education can expand the reach of these programs.

In addition, strengthening and expanding career and CTE pathways that lead students from K-12 to postsecondary education may help both to increase higher education enrollment and meet workforce needs. The Career Pathways Trust has supported the creation of programs intended to align high school and college education. There has also been substantial progress in expanding the number of high school CTE courses that qualify for fulfilling A-G requirement for UC and CSU admissions, further establishing CTE programs as pathways to UC and CSU, as well as to community colleges and the workforce; in the last decade, UC has increased the number of A-G approved CTE courses from 258 to over 12,000.²¹⁴ Continuing to develop distinct K-12 CTE pathways can help lead students to higher education and to careers for which there is demonstrated workforce demand.

Workforce Preparation—Cooperative Education

The conversation on workforce preparation is not confined to community colleges and adult basic education. California needs to take steps to ensure that college and university graduates are prepared for the workforce. Employer surveys suggest that college graduates are not well prepared for the jobs they enter. One recent survey found that only about 40 percent of employers found recent graduates' work ethic and communication skills to be proficient.²¹⁵ Surveys of student confidence entering the workplace have produced varying results. A recent survey of students at 4-year universities nationwide found, however, that only 36 percent of students thought they would graduate with the skills and knowledge they needed to succeed in the workplace; this survey also found that 39 percent of students never visited their school's career services office.²¹⁶

In the words of one faculty member, colleges and universities need to help students not just get degrees, but also learn how to translate those degrees into jobs and careers. Some disciplines do better than others in preparing students for careers and for transitioning into the workforce. In professional programs, like engineering, internships and work experience have long been an inherent part of the education. Some experts advised expanding this model more broadly through university education. Although academic organizations and faculty emphasize that the critical thinking and analytical skills taught in general education courses and in the liberal arts and sciences are key to workforce success, there is little structure or intentionality in helping students learn to transfer the skills they master in the classroom to workplace setting.²¹⁷ There are, however, examples of institutions that have approached career development as an integral part of the undergraduate education, especially through cooperative education, which is a model that alternates and integrates classroom learning and full-time participation

²¹⁴ University of California Office of the President, "A-G Guide—Career Technical Education," <https://www.ucop.edu/agguide/career-technical-education/index.html>. Accessed 8-30-2018.

²¹⁵ Jeremy Bauer-Wolf, "Overconfident Students, Dubious Employers," *Inside HigherEd* (February 23, 2018), <https://www.insidehighered.com/news/2018/02/23/study-students-believe-they-are-prepared-workplace-employers-disagree>. Accessed 7-24-2018.

²¹⁶ Strada Education Network and Gallup, *2017 College Student Survey: A Nationally Representative Survey of Currently Enrolled Students* (Washington, D.C.: Gallup, 2017).

²¹⁷ Bok, *The Struggle to Reform Our Colleges*, p. 171.

in a professional workplace. Northeastern University's "Co-op" program, for instance, gives the students the opportunity to integrate paid work fully into their course of study.²¹⁸ Analysts recommend that institutions of higher education integrate career planning with the educational curriculum and incorporate internships, service learning, experiential education and capstone projects more fully into that curriculum so that students can better understand the connections between classroom learning, workforce preparation and career development.²¹⁹

California's colleges and universities can take concrete steps to ensure that opportunities for career training and preparation are more widely available to all students. One community college president observed that many students in colleges and universities have jobs, but that work has no relationship or connection to their academic studies. If colleges and universities approached earn-and-learn and cooperative programs as an integral part of education, they would help students earn needed money while connecting work and learning. In addition, a faculty member noted that expanding access to career development opportunities and integrating those opportunities more fully into students' education could help provide students with the professional networks they need to transition successfully into the regional workforce. This is particularly important for underrepresented minority students or students from underprivileged backgrounds, who are less likely to have the advantage of the familial networks of their more affluent peers.

IV. Conclusion: The Ends of Education

In the last decade, California's universities and colleges weathered a storm of financial and institutional challenges. In some sense, they have moved from an acute crisis into a slow-moving one. The structural problems that colleges and universities confronted in the last recession remain. It is unclear how institutions of higher education will be able to protect students from cuts to enrollment and increases in cost during the next downturn. The state does not have a clear plan to close the projected bachelor's degree gap or meet industry demand for STEM workers. It is also unclear the extent to which and how quickly automation and artificial intelligence will make workers of varying skill levels redundant when the next recession again renders millions unemployed.

These challenges are not unique to California. Institutions of higher education are struggling to adapt to the 21st century. Indeed, the critique of the state of American higher education has emerged as a distinct genre. Recent books and studies show that many students in many areas of collegiate and university study do not appear to make significant progress over the course of their time in college; researchers question how much many students actually learn during the years they invest in higher education.²²⁰

²¹⁸ Aoun, *Robot-Proof*, Chapter 4, "The Experiential Difference."

²¹⁹ Jeffrey J. Selingo, *Reimagining the Career Center: How Colleges Can Better Engage and Prepare a New Generation of Students for the 21st Century Workforce* (entangled.solutions, July 2017).

²²⁰ William G. Bowen, Matthew M. Chingos and Michael S. McPherson, *Crossing the Finish Line: Completing College at America's Public Universities* (Princeton, NJ: Princeton University Press, 2011); Richard Arum and Josipa Roksa, *Academically Adrift: Limited Learning on College Campuses* (Chicago: University of Chicago Press, 2010).

Collegiate and post-collegiate success often appears linked more closely to parental income and prior preparation than to undergraduate education.²²¹ Critics have argued that the practical value of college degrees may lie primarily in their function of signaling preexisting traits to potential employers.²²² “Our great, democratic university system,” in the words of Anthony Grafton, a former president of the American Historical Society, “has become a pillar of social stability—a broken community many of whose members drift through, learning little, only to return to the economic and social box that they were born into.”²²³ Worse still is the possibility that some students may become worse off with too much student debt. Indeed, some financial industry observers view student debt as part of a financial crisis in the making.²²⁴

A review of the literature surrounding the California Master Plan for Higher Education suggests that inequities are more fully baked into “our great, democratic university system” than we would like to think. The Master Plan was designed to provide a broadly traditional education to a broadly traditional student body. Today, neither traditional education nor the traditional student is or can be the sole focus of educational planning. There is reason to ask whether universities, curricula and expectations are really organized for today’s student or for the students of yesterday. A positive sign from the review process was considerable understanding on the part of faculty and senior administrators that institutions of higher education have often not been oriented toward students’ needs. There was considerable commitment on the part of participants to recognize student goals and ensure that institutions of higher education help students meet those goals.

With the growing diversity of California and a growing emphasis on accessibility and completion, the structures of the Master Plan have been asked to bear responsibilities for which they were not designed. Indeed, colleges and universities around the country are assuming or being asked to assume new responsibilities in relation to their students’ physical and mental well-being, in addition to their instruction and learning. Under circumstances of technological and institutional change, evocations of a past golden age may not be helpful for confronting the ongoing transformation of higher education. In fact, narratives of decline may inhibit our ability to understand and respond to this transformation. In a changing world and in a changing world of work, traditional higher education may not be what many students, especially non-traditional students and working adults, need. It was a crisis regarding the quality and purpose of German universities around 1800 that led scholars to conceptualize the modern university in the first place. “Perhaps,” writes historian Paul Reitter with respect to traditional liberal arts education, “our high-pressure moment could turn out to yield . . . persuasive new ways of expressing

²²¹ Elizabeth A. Armstrong and Laura T. Hamilton, *Paying for the Party: How College Maintains Inequality* (Cambridge, MA: Harvard University Press, 2013).

²²² Bryan Caplan, *The Case Against Education: Why the Education System is a Waste of Time and Money* (Princeton, NJ: Princeton University, 2018).

²²³ Anthony Grafton, “Our Universities: Why Are They Failing?” *The New York Review of Books* (November 24, 2011).

²²⁴ Alex Williams, “Are You Ready for the Financial Crisis of 2019?” *The New York Times* (December 10, 2018), <https://www.nytimes.com/2018/12/10/style/2019-financial-crisis.html>. Accessed 12-19-2018.

what liberal education can be.”²²⁵ It is possible to say the same about higher education in California more generally.

The Master Plan was a bold design for mid-20th century American higher education. In the course of the review, some wished to look to the Master Plan as a continued guiding light, while others wished to move past it, to allow for more expansive conversations to address the challenges ahead. This latter perspective recognizes the differences that separate California today from the California of 1960. The Master Plan was the product of a time when Californians and policymakers were confident in the possibilities of centralized planning to address social problems and advance social goals; it was a document from the age of the State Water Project and of highway construction. Since 1960, however, California has gone through dramatic demographic, political and economic transformations; projections of technological change suggest that equally substantial changes in the character of work and shape of the economy are coming.

It is clear that a coherent and shared vision for California’s system of higher education as one of life-long learning is necessary for the 21st century. In the last decades, researchers and policymakers have produced a small library of reports, reviews and research papers diagnosing and analyzing the deficiencies of California’s institutions of postsecondary education and proposing remedies. What is missing is a systemic reimagination of the ends of education in light of 21st century conditions. Taking California higher education forward requires grappling with the different expectations that today’s students have of colleges and universities and the different outcomes that they seek from postsecondary education. It also requires asking what systematically should be accomplished in order to prepare California’s college and university students for a rapidly changing economy and world of work. The importance of higher education and life-long learning is likely only to grow as automation and artificial intelligence compete with human workers and place greater pressure on individuals to obtain both the technical skills that will allow them to work with new technologies and the human skills that will help to protect them from being replaced by a machine or algorithm. A clear conception of the goals for higher education and life-long learning the 21st century is needed to ensure that new policies and approaches will strengthen our institutions and benefit Californians for decades to come.

²²⁵ Paul Reitter, “The Business of Learning,” *The New York Review of Books* (February 22, 2018), p. 33.

Appendix A: Table of Cross-Segmental Strategies Identified in the Review²²⁶

Key Cross-Segmental Strategies	Segments Involved
Increasing Enrollment	
<p><i>School districts should, to the greatest extent possible, align graduation requirements more fully with A-G course requirements for UC and CSU admission. High schools should also revise high school course placement and advising policies to encourage students to take the full sequence of A-G courses, including CTE courses that have been approved as meeting A-G.</i></p>	K-12, CSU and UC
<p><i>Continue to develop and support programs that promote college readiness, like summer bridge programs, and programs that promote a college-going culture among students, including college and university promise programs.²²⁷</i></p>	K-12, CCC, CSU and UC
<p><i>Consider revising the 1960 Master Plan's eligibility pools for UC and CSU freshmen admission.</i></p>	UC and CSU
<p><i>Expand campus capacity for increased enrollment by meeting existing legislative facility use expectations, especially through expanded summer enrollment, and through greater use of online education and cross-campus/cross-segmental course enrollment.</i></p>	CCC, CSU and UC
<p><i>Encourage partnerships between public and private, non-profit 4-year campuses that allow for the sharing of campus facilities and of institutional resources.</i></p>	CSU, UC and independent colleges and universities
<p><i>Explore and develop different models of hybrid campuses or stronger partnerships that address the campus constraints facing 4-year institutions by integrating them more closely with 2-year institutions.</i></p>	CCC, CSU and UC
<p><i>Continue and expand the community college applied baccalaureate degree program. Encourage community colleges to work with CSU campuses to</i></p>	CCC and CSU

²²⁶ This table is intended to reflect the range of strategies that were discussed by stakeholders and/or featured in the literature review. The table is not intended to be an exhaustive list, nor are the strategies highlighted intended to be viewed as recommendations per se.

²²⁷ Many other programs administered outside of the formal higher education institutional structure also promote college-going culture, such as the California Student Opportunity and Access Program.

Key Cross-Segmental Strategies	Segments Involved
<i>identify where the community college baccalaureate can specifically serve regional workforce needs and students who are not otherwise served by the transfer function.</i>	
Increasing Completion	
<i>Continue to support on-going reforms to remediation and developmental education and encourage continued collaboration and development of clear and coherent degree pathway programs.</i>	CCC, CSU and UC
<i>Continue to promote online education and cross-campus/cross-segmental course enrollment in order to eliminate course bottlenecks and ensure that students are able to take the courses they need to take, when they need to take them.</i>	CCC, CSU and UC
<i>Continue to streamline, simplify and promote the transfer function through greater coordination between the community colleges and 4-year segments through continued expansion of the Associate Degree for Transfer Program, as well as through continued development of transfer pathway with a guarantee of admission to the UC system.</i>	CCC, CSU and UC
<i>Encourage 2- and 4-year campuses to make greater use of joint facilities and of campus centers in order to provide students with a clearer and more coherent transfer process.</i>	CCC, CSU and UC
Evaluating and Sustaining Increased Enrollment and Completion	
<i>Establish a comprehensive system of data collection to track the progress of California students from K-12 through higher education and into the workforce.</i>	K-12, CCC, CSU, UC, independent colleges and universities, other state agencies
<i>Provide a more stable foundation for sustaining increased enrollment by encouraging greater transparency in higher education finance and academic cost structures, establishing greater alignment between cost structures and state educational priorities and identifying capital spending priorities accordingly.</i>	CCC, CSU and UC
Re-Skilling Opportunities for Adults	

Key Cross-Segmental Strategies	Segments Involved
<p><i>Institutions of higher education, both public and private, should collaborate to create a new “Master Plan for Continuing Education” that would provide for a more coordinated and more easily navigated system of life-long education. This system would fully recognize the range of providers of continuing education—including university extension schools and non-profit, private universities that serve adult learners, as well as the community colleges—and provide a framework for coordination and integration of reskilling opportunities.</i></p>	<p><i>CCC, CSU and UC, the extension education wings of CSU and UC, and private institutions and providers</i></p>
<p><i>Encourage institutions of higher education, both public and private, to coordinate in recognizing, improving and institutionalizing emerging credentials, like nanodegrees and digital badges. Institutions should also work toward a system where these new credentials are stackable and substantially articulated among institutions.</i></p>	<p><i>CCC, CSU and UC, the extension education wings of CSU and UC, and private institutions and providers</i></p>
<p><i>Encourage institutions of higher education, both public and private, to collaborate in developing common approaches and metrics to honor adult students’ experiential learning. This may include the development of agreed upon metrics for competency-based education to supplement existing credit-hour measures of academic learning.</i></p>	<p><i>CCC, CSU, UC and private institutions and providers</i></p>
<p><i>Provide adult learners with searchable information on the career and economic value of different credentials in different fields from different institutions, either through a comprehensive education data system or through another system of data collection and reporting.</i></p>	<p><i>CCC, CSU, UC and private institutions and providers</i></p>
Aligning Higher Education and Regional Economics	
<p><i>Create regional coordinating entities that include representatives from the leadership of K-12 and higher education, and from business and industry, labor and government, that serve to improve coordination between institutions of higher education and economic and community stakeholders.</i></p>	<p><i>K-12, CCC, CSU, UC, private institutions, business, labor and government</i></p>
<p><i>Continue to invest in the community college Strong Workforce Program and its model of collaboration with regional employers and workforce development boards to meet regional workforce needs. Explore where and how UC and CSU campuses can systematically adopt aspects of or join these collaborations between community colleges and regional economic partners.</i></p>	<p><i>CCC, CSU, UC and regional employers and economic entities</i></p>

Key Cross-Segmental Strategies	Segments Involved
<p><i>Continue to develop and strengthen K-12 CTE pathways that both respond to demonstrated regional workforce demand and meet requirements for enrollment in 4-year institutions.</i></p>	K-12, CCC, CSU and UC
<p><i>Encourage higher education departments and schools to develop advisory boards that act as points of contact to and conduits for communication with local companies and employers. These advisory boards can also advise departments on developing approaches to helping students learn how to connect the classroom experience to job skills.</i></p>	Higher education segments and regional employers
<p><i>Encourage institutions of higher education to do more to link the education they provide with the career goals of students. This can include more fully integrating cooperative education, internships, service learning and experiential education into the curricula and working with regional employers to develop “earn and learn” opportunities for students.</i></p>	Higher education segments and regional employers

References

Adelman, Cliff et al. *The Degree Qualifications Profile: A Learning-Centered Framework for what College Graduates Should Know and Be Able To Do To Earn the Associate, Bachelor's or Master's Degree*. Indianapolis, IN: Lumina Foundation, 2014. Retrieved from: <https://www.luminafoundation.org/files/resources/dqp.pdf>.

Angeli, Mallory and Ryan Fuller. *The Degree Gap: Are University Graduates Making Full Use of Their Degrees*. Sacramento, CA: California Postsecondary Education Commission, 2009. Retrieved from: <https://files.eric.ed.gov/fulltext/ED507514.pdf>.

Aoun, Joseph E. *Robot-Proof: Higher Education in the Age of Artificial Intelligence*. Cambridge, MA: The MIT Press, 2017.

Armstrong, Elizabeth A. and Laura T. Hamilton. *Paying for the Party: How College Maintains Inequality*. Cambridge, MA: Harvard University Press, 2013.

Arum, Richard and Josipa Roksa. *Academically Adrift: Limited Learning on College Campuses*. Chicago: University of Chicago Press, 2010.

Assembly Committee on Higher Education. *Master Plan for Higher Education in Focus [Draft Report]*. 1993. Retrieved from: <http://oac.cdlib.org/view?docId=hb2p3004mx&query=&brand=oac4>.

Bady, Aaron and Mike Konczal. "From Master Plan to No Plan: The Slow Death of Public Higher Education." *Dissent* 59, no. 4 (Fall 2012): 10-16. Retrieved from: <https://www.dissentmagazine.org/article/from-master-plan-to-no-plan-the-slow-death-of-public-higher-education>.

Baldassare, Mark et al. *Californians & Education*. San Francisco, CA: Public Policy Institute of California, 2017. Retrieved from: http://www.ppic.org/content/pubs/survey/S_417MBS.pdf.

Bauer-Wolf, Jeremy, "Overconfident Students, Dubious Employers." *Inside HigherEd* (February 23, 2018). Retrieved from: <https://www.insidehighered.com/news/2018/02/23/study-students-believe-they-are-prepared-workplace-employers-disagree>.

Benjamin, Roger and Stephen Carroll. *Breaking the Social Contract: The Fiscal Crisis in California Higher Education*. Santa Monica, CA: RAND, Council for Aid to Education, 1997. Retrieved from: https://www.rand.org/content/dam/rand/pubs/aid_to_edu_docs/2005/CAE01.pdf.

Bensimon, Estela Mara and Alicia Down. "Dimensions of the Transfer Choice Gap: Experiences of Latina and Latino Students who Navigated Transfer Pathways." *Harvard Educational Review* 79, no. 4 (Winter 2009): 632-658.

Bohn, Sarah. *California's Need for Skilled Workers*. San Francisco, CA: Public Policy Institute of California, 2014. Retrieved from: https://www.ppic.org/content/pubs/report/R_914SBR.pdf.

Bok, Derek. *The Struggle to Reform Our Colleges*. Princeton, NJ: Princeton University Press, 2017.

Bowen, William G., Matthew M. Chingos and Michael S. McPherson. *Crossing the Finish Line: Completing College at America's Public Universities*. Princeton, NJ: Princeton University Press, 2011.

Bowen, William G. *The "Cost Disease" In Higher Education: Is Technology the Answer?* Stanford, CA: The Tanner Lectures, 2012. Retrieved from: <http://www.ithaka.org/sites/default/files/files/ITHAKA-TheCostDiseaseinHigherEducation.pdf>.

Bracco, Kathy Reeve and Patrick M. Callan. *Competition and Collaboration in California Higher Education*. San Jose, CA: National Center for Public Policy and Higher Education, 2002. Retrieved from: <http://www.highereducation.org/reports/calcomp/callen.pdf>.

Breneman, David W. *The Challenges Facing California Higher Education: A Memorandum to the New Governor of California*. San Jose, CA: National Center for Public Policy and Higher Education, 1998. Retrieved from: <http://www.highereducation.org/reports/breneman/breneman.pdf>.

Burdman, Pamela. "Does California's Master Plan Still Work?" *Change: The Magazine of Higher Learning* 41, no. 4 (2009): 28-35. Retrieved from: <http://www.highereducation.org/crosstalk/ctbook/pdfbook/MasterPlanBookLayout.pdf>.

California Budget Project. *From State to Student: How State Disinvestment Has Shifted Higher Education Costs to Students and Families*. Sacramento, CA: 2014. Retrieved from: http://calbudgetcenter.org/wp-content/uploads/140506_From_State_to_Student_BB.pdf.

California Citizens Commission on Higher Education, *Toward A State of Learning: California Higher Education for the Twenty-First Century*. Los Angeles, CA: Center for Governmental Studies, 1999. Retrieved from: <https://www.ucop.edu/acadinit/mastplan/ccche/ccchefinalreport.pdf>.

California Competes. *Mind the Gap: Delivering on California's Promise for Higher Education*. Berkeley, CA: 2015. Retrieved from: <http://californiacompetes.org/degree-gap/>.

_____. *Moving Past the Master Plan: Report on the California Master Plan for Higher Education*. Oakland, CA: 2017. Retrieved from: <http://californiacompetes.org/assets/general-files/Master-Plan-Report- -with-cover-for-hearing.pdf>.

_____. *Out of the Dark: Bringing California's Education Data into the 21st Century*. Oakland, CA: 2018. Retrieved from: <http://californiacompetes.org/publications/out-of-the-dark>.

_____. *Wanted: Social and Economic Mobility for California's Stranded Workers*. Oakland, CA: 2018. Retrieved from: http://californiacompetes.org/assets/general-files/CACompetes_StrandedWorkers_Final.pdf.

California Postsecondary Education Commission. *The Master Plan, Then and Now: Policies of the 1960-1975 Master Plan for Higher Education in Light of 1993 Realities*. Commission Report 93-6. Sacramento, CA: California Postsecondary Education Commission, 1993.

_____. *Developing a System to Compare Degree Production with Labor Market Demand*. Working Paper WP/05-03. Sacramento, CA: California Postsecondary Education Commission, September 2005.

California State Assembly Budget Subcommittee No. 2 on Education Finance. *Agenda, Wednesday, April 26, 2017—California State University*. Retrieved from:

[https://abgt.assembly.ca.gov/sites/abgt.assembly.ca.gov/files/April 26 - CSU Agenda.pdf](https://abgt.assembly.ca.gov/sites/abgt.assembly.ca.gov/files/April%2026%20-%20CSU%20Agenda.pdf).

California State Economic Development Department. *California Labor Market Review*. June 2018.

Retrieved from: <https://www.labormarketinfo.edd.ca.gov/pub/california-labor-market-publications.html>.

California State University Office of the Chancellor. *CSU Undergraduate Outcomes Report: Graduation Rates, Persistence Rates, and Analysis of Factors Related to Outcomes*. Long Beach, CA: The California State University, 2016. Retrieved from: http://asd.calstate.edu/doc/CSU-Undergraduate-Outcomes-Report_FINAL.pdf.

California State University Office of the Chancellor. *Statistical Abstract to July 2009*. Long Beach, CA: The California State University, 2010. Retrieved from:

http://www.calstate.edu/as/stat_abstract/stat0809/index.shtml.

_____. *Towards Greater Statewide Degree Attainment by 2030 -- California State University Response to Questions Posed in the Budget Act of 2016* (March 1, 2017). Retrieved from:

<https://www.calstate.edu/budget/fybudget/legislative-reports/CSU-Report-Greater-Statewide-Degree-Attainment-2030.pdf>.

California Workforce Development Board. *Skills Attainment for Upward Mobility; Aligned Services for Shared Prosperity: California's Unified Strategic Workforce Development Plan Under the Workforce Innovation and Opportunity Act (WIOA) for Program Years 2016-2019*. Sacramento, CA: 2016. Retrieved from: <https://cwdb.ca.gov/wp-content/uploads/sites/43/2017/12/Unified-State-Plan-plain-text.pdf>.

Callan, Patrick. "The Perils of Success." In *Clark Kerr's World of Higher Education Reaches the 21st Century*, edited by Sheldon Rothblatt, 61-84. New York: Springer, 2012.

_____. *California Higher Education, the Master Plan, and the Erosion of College Opportunity*. San Jose, CA: National Center for Public Policy and Higher Education, 2009. Retrieved from:

http://www.highereducation.org/reports/cal_highered/cal_highered.pdf.

Campaign for College Opportunity. *Affirming Equal Opportunity and Access in the University of California So California Prospering*. Los Angeles and Sacramento, CA: 2015. Retrieved from:

<https://files.eric.ed.gov/fulltext/ED571125.pdf>.

_____. *Access Denied: Rising Selectivity at California's Public Universities*. Los Angeles and Sacramento, CA: 2015. Retrieved from: https://collegecampaign.org/wp-content/uploads/2015/05/2015-Access-Denied_Full-Report_FINAL.pdf.

_____. *Needed: Sy(STEM)ic Response: How California's Public Colleges and Universities are Key to Strengthening the Science, Technology, Engineering, and Math (STEM) and Health Workforce*. Los Angeles and Sacramento, CA: June 2016. Retrieved from: <https://files.eric.ed.gov/fulltext/ED571129.pdf>.

_____. *The Transfer Maze: The High Cost to Students and the State of California*. Los Angeles and Sacramento, CA: 2017. Retrieved from: <http://collegecampaign.org/wp-content/uploads/2017/09/CCO-2017-TransferMazeReport-27.pdf>.

Caplan, Bryan. *The Case Against Education: Why the Education System is a Waste of Time and Money*. Princeton, NJ: Princeton University, 2018.

Castrechini, Sebastian. "Improving Data to Support Adult Learners." California Competes—Blog Posting. June 14, 2018. Retrieved from: <http://californiacompetes.org/blog/improving-data-to-support-adult-learners>.

Center for Urban Education. *Pathways, Partnerships, and Progress: Transforming a Community College*. Los Angeles: Center for Urban Education, Rossier School of Education, University of Southern California, 2017. Retrieved from: <https://cue.usc.edu/pathways-partnerships-report/>.

Christ, Carol T. "Small Liberal Arts Colleges and Enrollment Capacity at Public Universities: Imagining a Consortium Approach." CSHE Research and Occasional Paper Series, CSHE.2.16 (February 2015). Retrieved from: <https://cshe.berkeley.edu/publications/small-liberal-arts-colleges-and-enrollment-capacity-public-universities-imagining>.

College Futures Foundation. *Securing the Public Trust: Practical Steps toward Higher Education Finance Reform in California*. San Francisco, CA: 2017. Retrieved from: https://collegefutures.org/wp-content/uploads/2017/01/Securing_Public_Trust_REPORT_Jan2017.pdf.

Commission for the Review of the Master Plan for Higher Education. *The Challenge of Change: A Reassessment of the California Community College*. Sacramento, CA: 1986. Retrieved from: <https://calisphere.org/item/ark:/13030/hb2779n7f2/>.

_____. *The Master Plan Renewed: Unity, Equity, Quality, and Efficiency in California Postsecondary Education*. Sacramento, CA: 1987. Retrieved from: http://www.lib.berkeley.edu/uchistory/archives_exhibits/masterplan/MPComm1987.pdf.

Cooper, Darla M. et al. *Through the Gate: Mapping the Transfer Landscape for California Community College Students*. San Rafael, CA: The RP Group, 2017. Retrieved from: <http://rpgroup.org/Portals/0/Documents/Projects/ThroughtheGate/Through-the-Gate-Phase-I-Technical-Report.pdf>.

Coordinating Council for Higher Education, *The Master Plan Five Years Later*. Sacramento and San Francisco, CA: 1966. Retrieved from: <http://www.oac.cdlib.org/view?docId=hb296nb19h&query=&brand=oac4>.

Corporation for a Skilled Workforce. *Making a Market for Competency-Based Credentials*. Ann Arbor, MI: 2013. Retrieved from: <http://skilledwork.org/publications/making-a-market/>.

Crow, Michael M. and William B. Dabars. *Designing the New American University*. Baltimore, MD: John Hopkins University Press, 2015.

Cuellar Mejia, Marisol, Olga Rodriguez and Hans Johnson. *Preparing Students for Success in California's Community Colleges*. San Francisco, CA: Public Policy Institute of California, 2016. Retrieved from: http://www.ppic.org/content/pubs/report/R_1116MMR.pdf.

Delisle, Jason and Kim Dancy. "Do State Subsidies for Public Universities Favor the Affluent?" Economic Studies at Brookings, Evidence Speaks Reports, Vol. 1, #23 (July 28, 2016). Retrieved from: <https://www.brookings.edu/research/do-state-subsidies-for-public-universities-favor-the-affluent/>.

Douglass, John Aubrey. 2000. *The California Idea and American Higher Education: 1850 to the 1960 Master Plan*. Stanford, CA: Stanford University Press.

_____. "Investment Patterns in California Higher Education and Policy Options for a Possible Future." CSHE Research & Occasional Paper Series: CSHE.5.02 (May 2002). Retrieved from: <https://cshe.berkeley.edu/sites/default/files/publications/rop.jd.calfuture.5.02.pdf>.

_____. "From Chaos to Order and Back? A Revisionist Reflection on the California Master Plan for Higher Education@50 and Thoughts About its Future." CSHE Research and Occasional Paper Series: CSHE.7.10 (May 2010). Retrieved from: <https://cshe.berkeley.edu/publications/chaos-order-and-back-a-revisionist-reflection-california-master-plan-higher-education50>.

Education Trust-West, The. *Hear My Voice: Strengthening the College Pipeline for Young Men of Color in California*. Oakland, CA: 2017. Retrieved from: <https://collegefutures.org/publication/hear-my-voice-strengthening-the-college-pipeline-for-young-men-of-color-2017/>.

Fain, Paul. "Two-Plus-Two in Temecula." *Inside HigherEd*. July 30, 2015. Retrieved from: <https://www.insidehighered.com/news/2015/07/30/csu-san-marcos-and-mt-san-jacinto-college-travel-team-joint-degree-program>.

_____. "Helping Career Education Become a First Choice." *Inside HigherEd*. July 5, 2017. Retrieved from: <https://www.insidehighered.com/news/2017/07/05/california-community-colleges-seek-rebrand-cte-state-kicks-new-money>.

Finney, Joni E. et al. *From Master Plan to Mediocrity: Higher Education Performance & Policy in California*. Philadelphia: Institute for Research on Higher Education, 2014. Retrieved from: http://www.gse.upenn.edu/pdf/irhe/California_Report.pdf.

Fong, Anthony, Vanessa Barrat and Neal Finkelstein. *Examination of Data Usability Options for Assessing Eligibility for Higher Education in California*. San Francisco, CA: WestEd, 2018.

Frey, Carl Benedikt and Michael A. Osborne. *The Future of Employment: How Susceptible Are Jobs to Computerisation?* Working Paper. Oxford: Oxford Martin Programme on Technology and Employment, September 2013. Retrieved from: <https://www.oxfordmartin.ox.ac.uk/publications/view/1314>.

Fuller, Joseph B. and Manjari Raman, *Dismissed by Degrees: How Degree Inflation is Undermining U.S. Competitiveness and Hurting America's Middle Class* (Accenture, Grads of Life, Harvard Business School: October 2017). Retrieved from: <https://www.hbs.edu/managing-the-future-of-work/Documents/dismissed-by-degrees.pdf>.

Gándara, Patricia et al. *Building Pathways to Transfer: Community Colleges that Break the Chain of Failure for Students of Color*. Los Angeles, CA: The Civil Right Projects, 2012. Retrieved from: <https://civilrightsproject.ucla.edu/research/college-access/diversity/building-pathways-to-transfer-community-colleges-that-break-the-chain-of-failure-for-students-of-color/Fullpaper-Building-Pathways-final-2-1-12b.pdf>.

Gándara, Patricia and Marcela Cuellar. *The Baccalaureate in the California Community College: Current Challenges & Future Prospects*. Los Angeles, CA: The Civil Rights Project, 2016. Retrieved from: <https://www.civilrightsproject.ucla.edu/research/college-access/underrepresented-students/the-baccalaureate-in-the-california-community-college-current-challenges-future-prospects/CA-CC-BA-report-070616.pdf>.

Gao, Niu and Hans Johnson. *Improving College Pathways in California*. San Francisco, CA: Public Policy Institute of California, 2017. Retrieved from: http://www.ppic.org/wp-content/uploads/r_1117ngr.pdf.

Geiser, Saul and Richard C. Atkinson. "Beyond the Master Plan: The Case for Restructuring Baccalaureate Education in California." *California Journal of Politics and Policy* 4, no 1 (January 2013): 67-123.

Grafton, Anthony. "Our Universities: Why Are They Failing?" *The New York Review of Books* (November 24, 2011). Retrieved from: <http://www.nybooks.com/articles/2011/11/24/our-universities-why-are-they-failing/>.

Hansen, W. Lee. and Burton A. Weisbrod. "The Distribution of Costs and Direct Benefits of Public Higher Education: The Case of California." *The Journal of Human Resources* 4, no. 2(Spring 1969): 176-191.

Jackson, Jacob and Kevin Cook. *Improving College Graduation Rates: A Closer Look at California State University*. San Francisco, CA: Public Policy Institute of California, 2016. Retrieved from: http://www.ppic.org/content/pubs/report/R_516JJR.pdf.

_____. *Modernizing California's Education Data System*. San Francisco, CA: Public Policy Institute of California, 2018. Retrieved from: <https://www.ppic.org/wp-content/uploads/modernizing-californias-education-data-system-1118.pdf>.

Jackson, Jacob and Olga Rodriguez. *College Readiness in California*. San Francisco, CA: Public Policy Institute of California, 2017. Retrieved from: <http://www.ppic.org/publication/college-readiness-in-california/>.

_____. *Higher Education in California: New Goals for the Master Plan*. San Francisco, CA: Public Policy Institute of California, 2010. Retrieved from: http://www.ppic.org/content/pubs/report/R_410HJR.pdf.

_____. *Defunding Higher Education: What Are the Effects on College Enrollment*. San Francisco, CA: Public Policy Institute of California, 2012. Retrieved from: http://www.ppic.org/content/pubs/report/R_512HJR.pdf.

_____. "The Rise and Fall of Enrollment at For-Profit Colleges." *Viewpoints: The PPIC Blog*. June 28, 2016. Retrieved from: <http://www.ppic.org/blog/the-rise-and-fall-of-enrollment-at-for-profit-colleges/>. Accessed 3-5-2018.

_____. "California's Brain Gain." Public Policy Institute of California Blog Entry. January 3, 2018. Retrieved from: <https://www.ppic.org/blog/californias-brain-gain/>. Accessed 12-18-2018.

Johnson, Hans et al. *Higher Education in California: Institutional Costs*. San Francisco, CA: Public Policy Institute of California, 2014. Retrieved from: http://www.ppic.org/content/pubs/report/R_1114HJR.pdf.

Johnson, Hans and Marisol Cuellar Mejia. *Online Learning and Student Outcomes in California's Community Colleges*. San Francisco, CA: Public Policy Institute of California, 2014. Retrieved from: http://www.ppic.org/content/pubs/report/R_514HJR.pdf.

Johnson, Hans, Marisol Cuellar Mejia and Sarah Bohn. *Will California Run Out of College Graduates?* San Francisco, CA: Public Policy Institute of California, 2015. Retrieved from: http://www.ppic.org/content/pubs/report/R_1015HJR.pdf.

Johnson, Hans, Marisol Cuellar Mejia, and Kevin Cook. *Successful Online Courses in California's Community Colleges*. San Francisco, CA: Public Policy Institute of California, 2015. Retrieved from: http://www.ppic.org/content/pubs/report/R_615HJR.pdf.

Johnson, Hans, Kevin Cook and Marisol Cuellar Mejia. *Meeting California's Need for College Graduates: A Regional Perspective*. San Francisco, CA: Public Policy Institute of California, 2017. Retrieved from: http://www.ppic.org/content/pubs/report/r_0617hjr.pdf.

Johnson, Hans et al. "Addressing California's Skills Gap," in *Higher Education in California*. San Francisco, CA: Public Policy Institute of California, 2017. Retrieved from: http://www.ppic.org/wp-content/uploads/r_0917hj2r.pdf.

Joint Committee on the Master Plan for Higher Education. *Report of the Joint Committee on the Master Plan for Higher Education*. Sacramento, CA: California Legislature, 1973. Retrieved from: <https://www.ucop.edu/acadinit/mastplan/JtCmte0973.pdf>.

Joint Committee for Review of the Master Plan for Higher Education. *California Faces...California's Future: Education for Citizenship in a Multicultural Democracy*. Sacramento, CA: California Legislature, 1989. Retrieved from: <https://www.ucop.edu/acadinit/mastplan/JtCmte0389.pdf>.

Joint Committee to Develop a Master Plan for Education. *The California Master Plan for Education*. Sacramento, CA: California Legislature, 2002. Retrieved from:
https://www.ucop.edu/acadinit/mastplan/master_plan2002.pdf.

Joint Committee on the Master Plan for Higher Education. *Appreciating Our Past, Ensuring Our Future: A Public Agenda of Needs for Higher Education in California*. 2010. Retrieved from:
<https://www.ucop.edu/acadinit/mastplan/Report2010Joint%20CmteMasterPlan.pdf>.

Kidder, William C. and Patricia Gándara. "Two Decades after the Affirmative Action Ban: Evaluating the University of California's Race-Neutral Efforts." Educational Testing Service, 2015. Retrieved from:
https://www.ets.org/Media/Research/pdf/kidder_paper.pdf.

Kirst, Michael W. et al. "Structures and Strategies for Adaptation," in W. Richard Scott and Michael W. Kirst, *Higher Education and Silicon Valley: Connected But Conflicted*, 202-238. Baltimore, MD: Johns Hopkins University Press, 2017.

Kisker, Carrie B., Arthur M. Cohen and Richard L. Wagoner. *Reforming Transfer and Articulation in California: Four Statewide Solution for Creating a More Successful and Seamless Transfer Path to the Baccalaureate*. Los Angeles, CA: Center for the Study of Community Colleges, 2010. Retrieved from:
http://www.facc.org/wp-content/uploads/2014/11/Reforming_Transfer.pdf.

Kowsky, Kim. "Lawmakers: No Master Plan Makeover," *UCLA Magazine*. April 1, 2010). Retrieved from:
http://magazine.ucla.edu/features/master_plan_makeover/.

Lapid, Patrick A. and John Aubrey Douglass. *College Affordability and the Emergence of Progressive Tuition Models: Are New Financial Aid Policies at Major Public Universities Working?* CSHE Research & Occasional Paper Series: CSHE.7.16 (June 2016). Retrieved from:
<https://cshe.berkeley.edu/publications/college-affordability-and-emergence-progressive-tuition-models-are-new-financial-aid>.

Legislative Analyst's Office. *The Master Plan at 50: Assessing California Vision for Higher Education*. Sacramento, CA: 2009. Retrieved from:
http://www.lao.ca.gov/2009/edu/master_plan_intro/master_plan_intro_111209.pdf.

_____. *The Master Plan at 50: Greater Than the Sums of Its Parts – Coordinating Higher Education in California*. Sacramento, CA: 2010. Retrieved from:
http://www.lao.ca.gov/reports/2010/edu/ed_coordination/ed_coordination_012810.pdf.

_____. *Implementation Update: Reforming Transfer From CCC to CSU*. Sacramento, CA: 2015. Retrieved from: <http://www.lao.ca.gov/reports/2015/edu/reforming-transfer/reforming-transfer-020215.pdf>.

_____. *Assessing UC and CSU Enrollment and Capacity*. Sacramento CA: 2017. Retrieved from:
<https://lao.ca.gov/Publications/Report/3532>.

_____. *Overview of Higher Education in California*. Sacramento, CA: 2017. Retrieved from: http://www.lao.ca.gov/handouts/education/2017/Overview_of_Higher_Education_in_California_083117.pdf.

_____. *California Community Colleges: Interim Evaluation of Baccalaureate Degree Pilot Program*. Sacramento, CA: 2017. Retrieved from: <http://www.lao.ca.gov/reports/2017/3722/ccc-baccalaureate-121917.pdf>.

_____. *The 2018-19 Budget: Higher Education Analysis*. Sacramento, CA: 2018. Retrieved from: <http://www.lao.ca.gov/reports/2018/3748/higher-ed-analysis-021518.pdf>.

_____. *CSU and UC: Major Budgets Trends*. Sacramento, CA: 2018. Retrieved from: <https://lao.ca.gov/handouts/education/2018/CSU-UC-Budget-Trends-081418.pdf>.

Lenz, Patrick J. *Paying for Space: A Brief Framing the Issues and Opportunities in Capital Finance for Higher Education in California*. San Francisco, CA: College Futures Foundation, 2017. Retrieved from: https://collegefutures.org/wp-content/uploads/2017/12/PayingforSpace_CollegeFutures_Lenz_2017.pdf.

Leonhardt, David. "California's Upward-Mobility Machine." *The New York Times*. September 17, 2015. Retrieved from: <https://www.nytimes.com/2015/09/17/upshot/californias-university-system-an-upward-mobility-machine.html>.

_____. "America's Great Working-Class Colleges." *The New York Times*. January 18, 2017. <https://www.nytimes.com/2017/01/18/opinion/sunday/americas-great-working-class-colleges.html>.

Little Hoover Commission. *A New Plan for A New Economy: Reimagining Higher Education*. Sacramento, CA: 2013. Retrieved from: <http://www.lhc.ca.gov/sites/lhc.ca.gov/files/Reports/218/Report218.pdf>.

Lohr, Steve. "Where the STEM Jobs Are (and Where They Aren't)." *The New York Times*. November 1, 2017. Retrieved from: <https://www.nytimes.com/2017/11/01/education/edlife/stem-jobs-industry-careers.html>.

Marginson, Simon. 2016. *The Dream is Dead: The Crisis of Clark Kerr's California Idea of Higher Education*. Oakland, CA: University of California Press.

_____. "And the Sky is Grey: The Ambivalent Outcomes of the California Master Plan for Higher Education." *Higher Education Quarterly* 72, no. 1(January 2018): 51-64.

Master Plan Survey Team. *A Master Plan for Higher Education in California, 1960-1975*. Sacramento, CA: California State Department of Education, 1960. Retrieved from: <https://www.ucop.edu/acadinit/mastplan/MasterPlan1960.pdf>.

McCarthy, Mary Alice. *Beyond the Skills Gap: Making Education Work for Students, Employers, and Communities*. Washington, DC: New America Foundation, 2014. Retrieved from: <https://www.luminafoundation.org/files/resources/beyond-the-skills-gap.pdf>.

McPherson, Michael S. and Lawrence S. Bacow. "Online Higher Education: Beyond the Hype Cycle." *Journal of Economic Perspectives* 29, no. 4 (Fall 2015): 135-154.

Mitra, Somjita et al. *L.A. & Orange County Community Colleges: Powering Economic Opportunity*. Center for a Competitive Workforce, 2017. Retrieved from: <https://laedc.org/2017/10/03/ccw-report/>.

Moore, Colleen, Nancy Shulock and Cristy Jensen, *Crafting a Student-Centered Transfer Process in California: Lessons from Other States*. Sacramento, CA: Institute of Higher Education Leadership and Policy, August 2009. Retrieved from: http://collegecampaign.org/wp-content/uploads/2014/06/R_Transfer_Report_08-09.pdf.

Moore, Colleen and Nancy Shulock. *Divided We Fail: Improving Completion and Closing Racial Gaps in California's Community Colleges*. Sacramento, CA: Institute for Higher Education Leadership & Policy, October 2010. Retrieved from: https://edsource.org/wp-content/uploads/old/divided_we_fail_final.pdf.

_____. *From Community College to University: Expectations for California's New Transfer Degrees*. San Francisco, CA: Public Policy Institute of California, 2014. Retrieved from: http://www.ppic.org/content/pubs/report/R_314CMR.pdf.

Moore, Colleen et al. *Organizing for Success: California's Regional Education Partnerships*. Sacramento, CA: Education Insights Center, 2015. Retrieved from: <https://files.eric.ed.gov/fulltext/ED574459.pdf>.

Moore, Colleen, Kathy Reeves Bracco and Thad Nodine. *California's Maze of Student Information: Education Data Systems Leave Critical Questions Unanswered*. Sacramento, CA: Education Insights Center, 2017. Retrieved from: <http://edinsightscenter.org/Portals/0/ReportPDFs/Maze-of-Information-Brief.pdf>.

Moore, Colleen, Cynthia Schrager and Kathy Reeves Bracco, *From Scatterplot to Roadmap: New Efforts to Improve Student Success in the California State University*. Sacramento, CA: CSU Student Success Network, 2017. Retrieved from:

http://csunetwork.edinsightscenter.org/Portals/2/Documents/CSU_Mapping_Report.pdf.

Moore, Colleen and Connie Tan. "Get Me from Point A to Point B:" *Student Perspectives on Barriers to Timely Graduation at the California State University*. Sacramento, CA: CSU Student Success Network and Education Insights Center, 2018. Retrieved from:

<http://edinsightscenter.org/Portals/0/ReportPDFs/CSU-A-to-B-report-final-ac.pdf>.

Muro, Mark et al. *Digitilization and the American Workforce*. Washington, DC: Metropolitan Policy Program at Brookings, 2017. Retrieved from: https://www.brookings.edu/wp-content/uploads/2017/11/mpp_2017nov15_digitalization_full_report.pdf.

Murphy, Patrick et al. *Higher Education in California: Performance Budgeting*. San Francisco, CA: Public Policy Institute of California, 2014. Retrieved from: <http://www.ppic.org/publication/higher-education-in-california-performance-budgeting/>.

Neault, Lynn Ceresino and William E. Piland, "Facing the Closed Door: What Community College Students Do After Being Denied Transfer Admission." *Community College Review* 42, no. 3(2014): 184-200.

Newfield, Christopher. 2016. *The Great Mistake: How We Wrecked Public Universities and How We Can Fix Them*. Baltimore, MD: The Johns Hopkins University.

Nodine, Thad, Ed. *Shared Responsibility: Strategies to Enhance Quality and Opportunity in California Higher Education. A Report to the Governor, the Legislature, the Higher Education Community, and the Citizens of California*. San Jose, CA: California Higher Education Policy Center, 1996. Retrieved from: <https://files.eric.ed.gov/fulltext/ED455719.pdf>.

Rainie, Lee and Janna Anderson. *The Future of Jobs and Jobs Training*. Pew Research Center, May 2017. Retrieved from: <http://www.pewinternet.org/2017/05/03/the-future-of-jobs-and-jobs-training/>.

Reitter, Paul. "The Business of Learning." *The New York Review of Books*. February 22, 2018.

Reidenbach, Luke. *How California's Workforce is Changing and Why State Policy Has to Change With It*. Sacramento, CA: California Budget & Policy Center, 2015. Retrieved from: <https://calbudgetcenter.org/resources/how-californias-workforce-is-changing-and-why-state-policy-has-to-change-with-it/>.

Rel West. *The College Promise in California: A Collection of Program Profiles*. WestEd, 2016. Retrieved from: https://californiacollegepromise.wested.org/wp-content/uploads/2018/03/REL_CollegePromise_Booklet_508.pdf.

Rodriguez, Olga, Marisol Cuellar Mejia and Hans Johnson. *Determining College Readiness in California's Community Colleges: A Survey of Assessment and Placement Policies*. San Francisco: Public Policy Institute of California, 2016. Retrieved from: http://www.ppic.org/content/pubs/report/R_1116ORR.pdf.

Scott, W. Richard, Michael W. Kirst et al. *Higher Education and Silicon Valley: Connected But Conflicted*. Baltimore, MD: Johns Hopkins University Press, 2017.

Scott, W. Richard et al. "Introduction," in W. Richard Scott and Michael W. Kirst, *Higher Education and Silicon Valley: Connected But Conflicted*, 1-15. Baltimore, MD: Johns Hopkins University Press, 2017.

_____. "The Changing Ecology of Higher Education in the San Francisco Bay Area," in W. Richard Scott and Michael W. Kirst, *Higher Education and Silicon Valley: Connected But Conflicted*, 16-54. Baltimore, MD: Johns Hopkins University Press, 2017.

_____. "Broader Forces Shaping the Fields of Higher Education and the Regional Economy," in W. Richard Scott and Michael W. Kirst, *Higher Education and Silicon Valley: Connected But Conflicted*, 95-139. Baltimore, MD: Johns Hopkins University Press, 2017.

_____. "Diverse Colleges in Varied Sub-Regions," in W. Richard Scott and Michael W. Kirst, *Higher Education and Silicon Valley: Connected But Conflicted*, 140-176. Baltimore, MD: Johns Hopkins University Press, 2017.

_____. "Structures and Strategies for Adaptation," in W. Richard Scott and Michael W. Kirst, *Higher Education and Silicon Valley: Connected But Conflicted*, 177-201. Baltimore, MD: Johns Hopkins University Press, 2017.

Select Committee on the Master Plan for Higher Education to the Coordinating Council for Higher Education. *The California Master Plan for Higher Education in the Seventies and Beyond*. Sacramento, CA: California State Department of Education, 1972. Retrieved from:

<https://www.ucop.edu/acadinit/mastplan/MPSelectCmte1172.pdf>.

Selingo, Jeffrey J. *Reimagining the Career Center: How Colleges Can Better Engage and Prepare a New Generation of Students for the 21st Century Workforce*. entangled.solutions, 2017.

Shulock, Nancy and Colleen Moore. *Invest in Success: How Finance Policy Can Increase Student Success at California's Community Colleges*. Sacramento, CA: Institute for Higher Education Leadership and Policy, 2007. Retrieved from:

<http://doingwhatmatters.cccco.edu/portals/6/docs/Invest%20in%20Success%20FINAL.pdf>.

Shulock, Nancy, Colleen Moore and Jeremy Offenstein. *The Road Less Traveled: Realizing the Potential of Career Technical Education in California Community Colleges*. Sacramento, CA: Institute for Higher Education Leadership and Policy, 2011. Retrieved from: <https://files.eric.ed.gov/fulltext/ED524217.pdf>.

Silva, Elena, Taylor White and Thomas Toch. *The Carnegie Unit: A Century-Old Standard in a Changing Education Landscape*. Stanford, CA: Carnegie Foundation for the Advancement of Teaching, 2015.

Silver, David, et al. *University Eligibility Study for the Public High School Class of 2015*. RTI International, 2017. Retrieved from: http://www opr ca gov/docs/RTI_Eligibility_Report_071417_FINALtoOPR pdf.

Sommeiller, Estelle and Mark Price. *The New Gilded Age: Income Inequality in the U.S. by State, Metropolitan Area, and County*. Washington, D.C.: Economic Policy Institute, 2018. Retrieved from: <https://www epi org/publication/the-new-gilded-age-income-inequality-in-the-u-s-by-state-metropolitan-area-and-county/>.

Spalding, Willard B. et al. *An Evaluation of the Tuition Free Principle in California Public Higher Education*. Sacramento and San Francisco, CA: Coordinating Council for Higher Education, 1965.

Strada Education Network and Gallup. *2017 College Student Survey: A Nationally Representative Survey of Currently Enrolled Students*. Washington, D.C.: Gallup, 2017. Retrieved from:

<https://news gallup com/reports/225161/2017-strada-gallup-college-student-survey.aspx>.

University of California Institutional Research and Academic Planning Unit. *Annual Accountability Report*. Oakland, CA: University of California Office of the President, 2017. Retrieved from: https://accountability.universityofcalifornia.edu/2017/documents/pdfs/2017Acct_Rpt_web.pdf.

University of California Office of the President. *Enrollment and Budgetary Scenarios for Increasing Degrees Awarded at UC* (March 2017). Retrieved from: https://www.ucop.edu/operating-budget/_files/legreports/16-17/EnrollmentandBudgetaryScenariosforIncreasingDegreesatUC-3-10-17.pdf.

Upshot, The. "Top Colleges Doing the Most for Low-Income Students." *The New York Times*. September 16, 2015. Retrieved from: <https://www.nytimes.com/interactive/2015/09/17/upshot/top-colleges-doing-the-most-for-low-income-students.html>.

Williams, Alex. "Are You Ready for the Financial Crisis of 2019?" *The New York Times*. December 10, 2018. Retrieved from: <https://www.nytimes.com/2018/12/10/style/2019-financial-crisis.html>. Accessed 12-19-2018.

Woolyard, LeBaron and Erin Larson, *Distance Education Report: 2017 Report*. Sacramento, CA: California Community Colleges Chancellor's Office, 2017. Retrieved from: <http://californiacommunitycolleges.cccco.edu/Portals/0/Reports/2017-DE-Report-Final-ADA.pdf>.