Texas College, Career, and Military Readiness Indicator Study

Preliminary Report

Lynn Mellor, Molly Cain, Joseph Miller, and Holly Williams

January 2025

American Institutes for Research® | AIR.ORG

AIR®
Advancing Evidence.
Improving Lives.

Contents

Exhibits

A. Introduction

In 2023, the Texas legislature appropriated funds for the Texas Education Agency (TEA) to study the effectiveness of the college, career, and military readiness (CCMR) indicators outlined in the Texas Education Code, Section 39.053(b). The study was intended to investigate the indicators and their correlation with postgraduation outcomes, including whether the indicators predict success in an entry-level, credit-bearing course or a self-sufficiency standard wage (SSSW). TEA contracted with the American Institutes for Research® (AIR®) to investigate the relationship of the CCMR indicators to postgraduation outcomes. This preliminary report focuses on the employment of high school graduates within 1 year of graduation and the wages earned. Follow-up reports will examine success in entry-level college courses and will expand on the analyses to look at additional workforce and college outcomes.

B. Background

The CCMR indicators established in the Texas Education Code are intended to measure graduates' preparedness for college, the workforce, or the military. These indicators are used in the state's A-F Accountability System and in the calculation of the outcomes bonus funding for districts. CCMR indicators in high school can help us understand whether students are likely to achieve positive outcomes after graduation. Texas high school graduates can demonstrate CCMR in several ways. Exhibit 1 describes each of the categories of readiness standards and their indicators as identified in the accountability system (TEA, 2024). Six indicators are classified as college ready and three indicators as career ready. Two indicators apply only to students with disabilities. Although there are 10 categories of readiness indicators, some indicators have multiple ways a student can achieve the indicator. For example, to meet the military readiness standard, a student must enlist in the military to achieve the indicator. However, to meet the Advanced Placement (AP) indicator, a student must earn a minimum score on one AP exam from a selection of almost 40 courses. These courses are offered in a variety of disciplines, ranging from math and sciences to art and languages. [1]

[1] Refer to the College Board website for a list of AP courses (https://apstudents.collegeboard.org/courses).

Exhibit 1. College, Career, and Military Categories of Readiness Standards in the Texas A-F Accountability System for Districts and High Schools

Standard	CCMR accountability system indicator
College ready	• Score a minimum of 3 on Advanced Placement (AP) or 4 on International Baccalaureate (IB) examinations. • Meet Texas Success Initiative (TSI) criteria (SAT/ACT/Texas Success Initiative Assessment/college preparatory course) in reading and mathematics. • Earn dual credit (9 hours or more in any subject or 3 hours or more in English language arts or mathematics). • Earn an associate degree. • Complete an OnRamps course in any subject and be eligible to earn college credit. • Graduate under an advanced diploma plan and currently be identified as a student in special education.
Career ready	• Complete a program of study and earn an aligned industry-based certification. • Earn a Level I or Level II certificate. • Graduate with a completed individualized education program and workforce readiness (graduation type codes 04, 05, 54, or 55) and be currently identified as a student in special education.
Military ready	• Enlist in the Armed Forces or Texas National Guard.

Note. The industry-based certification (IBC) indicator refers to the aligned IBC and a program-of-study completer that will be phased in with the class of 2026. The military ready indicator is excluded from this analysis because accountability calculations will not be conducted until data can be obtained directly from the United States Armed Forces. For a detailed description of the CCMR indicators, refer to TEA's *2024 Accountability Manual* https://tea.texas.gov/texas-schools/accountability/academic-accountability/performance-reporting/2024-accountability-manual.

Evidence of the predictive relationship of many of these indicators to postsecondary outcomes has been well established in research. For example, successfully completing advanced coursework such as AP, IB, and dual enrollment has been shown to predict future success in college (Adelman, 2006; Cumpton et al., 2012; Long et al., 2012; Smith et al., 2017; Warne et al., 2017). Another large body of research also demonstrates that students receive substantial economic returns on industry-based credentials, certificates, and degree completion (Baum et al., 2020; Grossman et al., 2015; Jepsen et al., 2014; Xu & Trimble, 2016). However, demonstrating success in AP Drawing may not have the same predictive validity on postgraduation outcomes as demonstrating success in AP Calculus. This report examines the predictive validity of the indicator and not the specific criteria students achieved to meet the indicator.

C. Study Overview and Research Questions

To understand whether and which of the CCMR indicators were most predictive of students earning (a) a C or better in a college entry-level, credit-bearing course in reading, writing, or mathematics or (b) an SSSW in Texas (see Appendix A for more detail on the definition of each outcome), the study addressed the following research questions:

Final Report

Results of the relationship of the CCMR indicators with success in entry-level, credit-bearing coursework (Research Question 2) will be presented in a final report that will be publicly available in March 2025.

1. To what extent does performance on the CCMR indicators predict whether students will earn an SSSW 1 year after high school graduation?
2. To what extent does performance on the CCMR indicators predict whether students will be successful in entry-level, credit-bearing coursework in reading, writing, and mathematics?
3. How do region, district type (i.e., rural, city, town, suburb, charter), and student characteristics (i.e., race/ethnicity, gender, students with disabilities, economically disadvantaged students, emergent bilingual students, and highly mobile students [(i.e., youth in foster care, homeless students, and migrant students)] influence the relationship between CCMR indicators and success in entry-level courses or earning an SSSW?

Although this study examines both postgraduation outcomes, this preliminary report focuses on the results of the predictive validity of earning an SSSW.

Detailed information about the data sources used in the study, the study population, and methods can be found in Appendix A.

D. Findings

In this section, we address Research Questions 1 and 3 by first describing the number of graduates who met CCMR standards and the specific indicators they met. We then describe the various pathways students took after high school graduation and the sample of graduates used in each of the analyses. Finally, we present the results of the predictive validity of CCMR indicators with earning an SSSW.

D.1. CCMR Readiness Rates for 2022 Graduates

Exhibit 2 presents the percentages of 2022 graduates who met CCMR standards. More than 60% of 2022 graduates met CCMR standards, with more than half the graduates (56.8%)

meeting a college-readiness standard. A smaller percentage of graduates (10.9%) met a career-readiness standard. However, almost 40% of 2022 graduates did not demonstrate college, career, or military readiness.

Exhibit 2. Percentage of 2022 Graduates Meeting CCMR Standards, by Student Characteristics

Student group	Student count	Met CCMR	College ready	Career ready
Total Graduates	368,678	61.2%	56.8%	10.9%
Female	184,575	63.7%	60.0%	11.1%
Male	184,103	58.7%	53.7%	10.7%
Asian	18,794	85.0%	83.9%	8.2%
Black	45,224	46.6%	41.7%	9.4%
Hispanic	191,121	57.9%	52.9%	12.0%
Other	10,369	61.8%	58.2%	9.3%
White	103,170	69.4%	65.6%	10.1%
Students with disabilities	32,445	76.2%	57.9%	31.7%
Emergent bilingual	40,395	44.8%	39.2%	10.3%
Economically disadvantaged	194,565	53.9%	48.6%	11.8%
Highly mobile	3,738	46.0%	40.5%	10.0%

Note. The designation categories are not mutually exclusive because students can meet both college- and career-ready indicators. Results may be slightly different than what is officially reported by TEA as the industry-based certification (IBC) indicator refers to the aligned IBC and a program-of-study completer that will be phased in with the class of 2026.

Exhibit 3 presents the percentages of 2022 graduates who met each CCMR indicator. Of all the indicators, more graduates (42.2%) met the Texas Success Initiative (TSI) than any other indicator, which was true across all student groups. With this indicator, students have multiple options to meet the criteria, including meeting the original TSI assessment (TSIA1) and the redesigned assessment (TSIA2) college-ready criteria, the SAT or ACT college-ready criteria, or by successfully completing and earning credit for a college preparatory course. For the two indicators specific to students with disabilities, a higher percentage of graduates met the advanced diploma indicator than the workforce readiness indicator.

Exhibit 3. Percentage of 2022 Graduates Who Met Each CCMR Indicator by Student Group

Student group	Student count	AP/IB	TSI	Dual credit	AA degree	OnRamps	Aligned IBC[a]	Level 1 or 2 certificate[a]	Students with disabilities count	Advanced diploma[a]	Workforce readiness[a,b]
Total	368,678	20.5%	42.2%	24.0%	2.4%	4.4%	7.9%	0.7%	32,445	56.3%	27.4%
Female	184,575	23.2%	43.2%	28.5%	3.2%	5.1%	9.0%	0.5%	11,840	59.0%	26.9%
Male	184,103	17.7%	41.2%	19.4%	1.7%	3.8%	6.9%	0.8%	20,605	54.7%	29.2%
Asian	18,794	58.6%	77.9%	31.4%	2.3%	6.4%	7.1%	0.2%	518	60.0%	32.2%
Black	45,224	8.3%	27.9%	15.6%	2.0%	2.5%	5.0%	0.4%	5,743	50.6%	32.4%
Hispanic	191,121	17.2%	35.9%	22.0%	3.2%	4.0%	8.9%	0.9%	16,719	58.6%	27.5%
Other	10,369	22.5%	45.5%	22.5%	1.7%	5.2%	6.4%	0.4%	984	54.0%	28.4%
White	103,170	24.6%	53.3%	30.0%	1.4%	5.6%	7.7%	0.4%	8,481	55.6%	27.0%
Students with disabilities	32,445	1.9%	10.7%	3.2%	0.2%	0.4%	4.9%	0.5%	32,445	56.3%	27.4%
Emergent bilingual	40,395	13.5%	19.7%	8.4%	1.1%	1.4%	6.2%	0.8%	5,220	60.4%	27.6%
Economically disadvantaged	194,565	13.8%	32.3%	19.0%	2.7%	3.1%	8.2%	0.8%	20,506	54.8%	28.2%
Highly mobile	3,738	9.9%	25.1%	12.1%	1.0%	2.2%	5.5%	0.4%	539	48.6%	29.7%

Note. AP = Advanced Placement; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas Success Initiative.

[a] This column indicates career-ready indicators. All other columns are college ready.

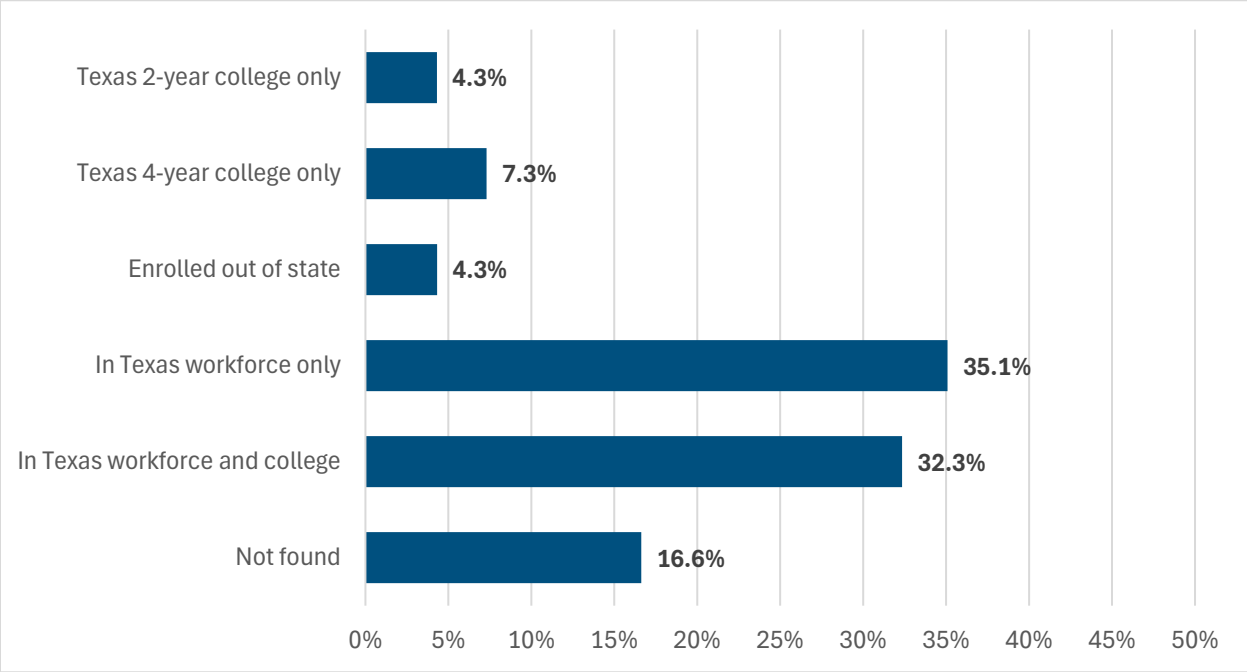
[b] Indicator applies only to students with disabilities.

D.2. Postsecondary Pathways of 2022 Graduates

Students who graduated in 2022 were followed for 1 year after high school graduation. A graduate's initial postsecondary pathway was defined by either their (a) immediate college enrollment in the fall 2022 semester following high school graduation (in both Texas and out-of-state colleges) or (b) entry into the Texas workforce within 1 year of high school graduation (i.e., reported in at least one quarter of the unemployment insurance (UI) data beginning in Quarter 3 of 2022 [see Section F for a description of the limitations of UI data]). Exhibit 4 presents the initial postsecondary pathways of 2022 graduates. Initial postsecondary pathways by student characteristics, district type, and education service center (ESC) region can be found in Exhibits B1 and B2 in Appendix B.

More than 65% of 2022 graduates went into the workforce, which included 32.3% of graduates who simultaneously enrolled in college, either part time or full time. Almost 12% of graduates enrolled in college only, with 4.3% enrolling in a 2-year Texas college and 7.3% enrolling in a 4-year Texas college. Slightly more than 4% of graduates enrolled in colleges outside Texas. Almost 17% of students were not found in any system. This group may comprise graduates who either entered the military, were independent contractors, self-employed, federal employee, or who may have been taking a gap year or not immediately enrolling in college.

Exhibit 4. Initial Postsecondary Pathway of 2022 Graduates



Note. N = 368,678. Percentages do not add up to 100% due to rounding.

As reported in Exhibit B1, there were some variations in the initial pathways across student characteristics. Black graduates were more likely to enter the Texas workforce than graduates overall. Students with disabilities and highly mobile students were also more likely to enter the Texas workforce. Asian graduates were more likely to enroll in 4-year colleges and out of state than graduates overall. Graduates with disabilities and emergent bilingual graduates were less likely to be found enrolled in college or in the Texas workforce. In addition, there were some regional variations, with higher percentages of students attending college in ESC Regions 1 and 19, and higher percentages of students directly entering the workforce in ESC Regions 3, 9, 11, 12, 14, 17, and 18 (Exhibit B2).

D.3. The Predicted Validity of CCMR Indicators on Earning an SSSW

The graduates included in this analysis were either in the workforce or simultaneously enrolled part time in college (see Appendix A for more detail about the sample). For this analysis, we focused on how well each CCMR indicator predicted whether a student earned an SSSW and each of the comparison wage thresholds (i.e., Texas annual median for 2018[2], Texas median wage for 2022–23, and 125% of the 2022–23 Texas median wage).[3] To aid interpretation, we present how much the predicted probability of earning an SSSW differs (Δ_{pp}) between a graduate who met the CCMR indicator (PP_1) and a graduate who did not (PP_0), controlling for student characteristics. Exhibit 5 presents the predicted probabilities of earning each wage threshold by CCMR indicator.[4] In Appendix B, we present results for each CCMR indicator by student characteristics (see Exhibits B3–B11).

Overall, the predicted probability of earning an SSSW was less than 1.5% for those who met any CCMR indicator.

On average, the predicted probability of earning an SSSW was less than 1% for those meeting any CCMR indicator, except for graduates meeting the Level 1 or 2 certificate criteria, where the predicted probability was 1.1%. The predicted probability of earning each of the other three wage thresholds within 1 year of high school graduation was less than 10% for students who met any CCMR indicator. The one exception was students who met the Level 1 or 2 certificate criteria, where the predicted probability of earning $37,099 was 13.2%. The median wage for all jobs in Texas in 2022–23 was $43,463. Earning $67,646 within 1 year of high school graduation is a difficult wage to achieve.

[2] This wage was an update to the wage used in TEA's calculation of high-wage jobs in the original Perkins state plan for career and technical education.
[3] As described in Appendix A, the research team considered other wage thresholds, in addition to the SSSW, as comparisons.
[4] Students may have met multiple CCMR indicators. Therefore, the comparison of predicted probabilities was between those who achieved that specific indicator versus those that did not achieve that specific indicator.

Career readiness indicators were more predictive than college readiness indicators of earning an SSSW.

On average, meeting CCMR through the career-ready criteria (i.e., aligned IBC or Level 1 or 2 certificate) was significantly associated with higher predicted increases in the probability of earning each of the wage thresholds. In fact, the aligned IBC or Level 1 or 2 certificate criteria were the only indicators significantly associated with a higher predicted increase in the probability of earning the SSSW. Conversely, the workforce readiness indicator earned by students with disabilities was associated with a predicted decrease in the probability of earning the SSSW. However, these results should be interpreted with caution because few students who met any of the CCMR indicators earned this wage.

Some college-ready CCMR indicators had a statistically significantly negative relationship with earning each of the wage thresholds.

While career-ready indicators were more predictive of earning a wage threshold, three college-ready indicators had a significantly negative relationship with earning each of the wage thresholds. For example, meeting CCMR through the AP/IB or TSI criteria was associated with a predicted decrease in the probability of earning at least $37,009 or $43,463. However, this is to be expected because students who met the AP/IB or TSI criteria were likely to be simultaneously enrolled in college and working part-time, potentially earning less than full-time employees.[6]

INTERPRETING THE PREDICTED PROBABILITY RESULTS

The predicted probability tables provide information for understanding how well each CCMR indicator predicted whether a student earned an SSSW and each of the comparison wage thresholds:

1. 2022 SSSW ($67,646)
2. Career and technical education wage criteria ($37,099)
3. 2022–23 median wage in Texas ($43,463)
4. 125% of the 2022–23 median wage in Texas ($54,329)

The columns of the tables represent how much the predicted probability of earning each wage differs between a graduate who met the CCMR indicator and a graduate who did not:

- $\boldsymbol{PP_0}$ is the predicted probability of earning each wage for a graduate who **did not meet** the indicator.
- $\boldsymbol{PP_1}$ is the predicted probability of earning each wage for a graduate who **met** the indicator.
- $\Delta_{\mathbf{pp}}$ is the difference in the predicted probabilities. Positive values in **dark blue** indicate graduates who met the indicator had a significant increase in the probability of earning each wage. Negative values in **dark red** indicate graduates who met the indicator had a significant decrease in the probability of earning each wage.[5]

[5] The difference in the predicted probabilities is not a simple subtraction, but an estimate of the expected change when a student goes from not meeting the indicator to meeting the indicator. See Appendix A for more detail.
[6] As we mention in Appendix A, a limitation of the unemployment insurance data is that they do not capture hours worked.

There was some evidence that CCMR indicators may be predictive of earning an SSSW over time.

Overall, a higher percentage of graduates were predicted to earn the 2018 annual median wage threshold of $37,099 (between 4.0% and 13.2% depending on which CCMR indicator was met), with fewer and fewer graduates predicted to earn each subsequent higher wage. In addition, earning a career-ready indicator was associated with a significant increase in the predicted probability of earning that wage. It is possible that, with additional education or training and quality work experience, graduates could earn the SSSW over time.

Exhibit 5. Predicted Probability of Earning Each Wage Threshold for Students Who Met and Did Not Meet the *CCMR* Indicator, by Indicator

CCMR indicator	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
AP/IB	0.4	0.4	-0.0	6.2	4.1	[c]**-2.1***	3.4	2.4	[c]**-1.0***	1.3	1.1	-0.2
TSI	0.5	0.4	-0.0	6.6	4.9	[c]**-1.7***	3.6	2.8	[c]**-0.8***	1.3	1.1	[c]**-0.2***
Dual credit	0.4	0.5	0.1	6.1	6.0	-0.1	3.3	3.4	0.0	1.2	1.4	0.1
AA degree	0.4	0.5	0.1	6.1	6.6	0.6	3.3	3.9	0.6	1.3	1.4	0.1
OnRamps	0.4	0.4	0.0	6.1	4.9	[c]**-1.2***	3.4	2.6	[c]**-0.8***	1.3	1.1	-0.2
Aligned IBC	0.4	0.6	[b]**0.2***	5.8	8.1	[b]**3.0***	3.2	4.9	[b]**1.7***	1.2	1.9	[b]**0.7***
Level 1 or 2 certificate	0.4	1.1	[b]**0.7***	6.0	13.2	[b]**7.3***	3.3	8.0	[b]**4.7***	1.2	3.3	[b]**2.1***
Advanced diploma[a]	0.3	0.4	0.1	4.4	5.9	[b]**1.4***	2.3	3.1	[b]**0.8***	0.9	1.2	0.3
Workforce readiness[a]	0.5	0.2	[c]**-0.3***	5.8	4.0	[c]**-1.7***	3.1	1.9	-1.2	1.2	0.8	-0.4

Note. N = 159,345.

[a] Indicator applies only to students with disabilities (N = 16,662).

[b] Values in dark blue preceded by a superscript b indicate a significant predicted increase in the probability of earning the wage threshold.

[c] Values in dark red preceded by superscript c indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

How Do Relationships Differ Across District Types and Education Service Center Regions?

Exhibits 6 and 7 present the results from the analyses that look at how the relationships between CCMR indicators and wage earnings differ by district type and education service center region. Overall, the estimated relationships indicate there is some meaningful variation in the predictive power of meeting CCMR indicators across Texas. For example, meeting the aligned IBC has more predictive power in city (0.3% versus 0.2% overall) or rural (0.6% versus 0.2% overall) areas of the state, while earning an AA degree has less predictive power in towns (-0.6%) or rural areas (-0.6%) of the state (Exhibit 6). Geographic variation was also seen across regions of the state (Exhibit 7). This has implications for the value of each CCMR indicator relative to the labor market across the state.

Exhibit 6. The Change in the Predicted Probability of Earning a Self-Sufficiency Standard Wage for Each *CCMR* Indicator, by District Type

District type	AP/IB	TSI	Dual credit	AA degree	OnRamps	Aligned IBC	Level 1 or 2 certificate	Advanced diploma[a]	Workforce ready[a]
	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}
Total	-0.0	-0.0	0.1	0.1	0.0	[b]**0.2***	[b]**0.7***	0.1	[c]**-0.3***
Charter	0.1	-0.1	0.2	[c]**-0.4***	[c]**-0.4***	[c]**-0.4***	[c]**-0.4***	0.2	-0.2
City	0.0	0.0	0.2	0.5	-0.1	[b]**0.3***	[b]**0.8***	0.1	-0.1
Rural	-0.3	-0.1	0.0	[c]**-0.6***	-0.3	[b]**0.6***	0.2	0.3	[c]**-0.7***
Suburb	0.0	0.0	0.0	-0.2	0.5	0.1	1.0	0.1	-0.3
Town	-0.2	[c]**-0.3***	0.1	[c]**-0.6***	-0.1	0.3	0.9	-0.3	-0.4

Note. AP = Advanced Placement; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas Success Initiative.

[a] Indicator applies only to students with disabilities.

[b] Values in dark blue preceded by superscript b indicate a significant predicted increase in the probability of earning the self-sufficiency standard wage (SSSW).

[c] Values in dark red preceded by a superscript c indicate a significant predicted decrease in the probability of earning the SSSW.

* $p < .01$.

Exhibit 7. The Change in the Predicted Probability of Earning a Self-Sufficiency Standard Wage for Each *CCMR* Indicator, by Education Service Center Region

Education service center region	AP/IB	TSI	Dual credit	AA degree	OnRamps	Aligned IBC	Level 1 or 2 certificate	Advanced diploma[a]	Workforce ready[a]
	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}	Δ_{pp}
Total	-0.0	-0.0	0.1	0.1	0.0	[b]**0.2***	[b]**0.7***	0.1	[c]**-0.3***
1 (Edinburg)	0.2	-0.1	0.2	0.4	0.6	[b]**0.4***	[b]**1.3***	0.1	-0.2
2 (Corpus Christi)	0.1	-0.1	0.2*	0.4	0.6	[b]**0.4***	[b]**1.4***	0.1	-0.3
3 (Victoria)	0.1	-0.1	[b]**0.2***	0.4	0.5	[b]**0.5***	[b]**1.5***	0.1	-0.4
4 (Houston)	0.0	-0.1	[b]**0.2***	0.2	0.3	[b]**0.3***	[b]**1.0***	0.1	-0.2
5 (Beaumont)	0.0	-0.1	[b]**0.1***	0.2	0.2	[b]**0.3***	[b]**0.9***	0.1	-0.3
6 (Huntsville)	0.0	-0.1	[b]**0.2***	0.2	0.2	[b]**0.3***	[b]**1.1***	0.1	[c]**-0.3***
7 (Kilgore)	0.0	-0.1	[b]**0.2***	0.2	0.1	[b]**0.3***	[b]**1.2***	0.2	[c]**-0.4***
8 (Mount Pleasant)	-0.1	[c]**-0.1***	[b]**0.1***	0.2	0.1	[b]**0.3***	[b]**1.1***	0.2	[c]**-0.4***
9 (Wichita Falls)	-0.1	[c]**-0.1***	[b]**0.1***	0.2	0.0	[b]**0.3***	[b]**1.1***	0.2	-0.5
10 (Richardson)	-0.1	[c]**-0.1***	[b]**0.1***	0.1	0.0	[b]**0.2***	[b]**0.9***	0.1	[c]**-0.3***
11 (Fort Worth)	[c]**-0.1***	[c]**-0.1***	0.1	0.1	0.0	[b]**0.2***	[b]**0.9***	0.1	[c]**-0.3***
12 (Waco)	[c]**-0.1***	[c]**-0.1***	0.1	0.1	-0.1	[b]**0.2***	[b]**0.9***	0.1	[c]**-0.3***
13 (Austin)	[c]**-0.1***	-0.1	0.1	0.1	-0.1	[b]**0.2***	[b]**1.0***	0.1	[c]**-0.3***
14 (Abilene)	[c]**-0.2***	-0.1	0.1	0.1	-0.1	[b]**0.2***	[b]**1.0***	0.1	[c]**-0.3***
15 (San Angelo)	[c]**-0.2***	-0.1	0.1	0.1	-0.2	[b]**0.2***	[b]**1.2***	0.2	[c]**-0.4***
16 (Amarillo)	[c]**-0.2***	-0.1	0.1	0.0	-0.2	0.2	[b]**1.0***	0.2	[c]**-0.4***
17 (Lubbock)	[c]**-0.2***	-0.1	0.1	0.0	[c]**-0.2***	0.2	1.1	0.2	[c]**-0.4***
18 (Midland)	[c]**-0.2***	-0.1	0.1	0.0	[c]**-0.3***	0.2	1.0	0.1	-0.3
19 (El Paso)	[c]**-0.2***	-0.1	0.0	0.0	[c]**-0.2***	0.2	0.8	0.1	-0.2
20 (San Antonio)	[c]**-0.2***	-0.1	0.0	0.0	[c]**-0.3***	0.2	0.9	0.1	-0.3

Note. AP = Advanced Placement; IB = International Baccalaureate; IBC = industry-based certification; TSI = Texas

[a] Indicator applies only to students with disabilities.

[b] Values in dark blue preceded by superscript b indicate a significant predicted increase in the probability of earning the self-sufficiency standard wage (SSSW).

[c] Values in dark red preceded by a superscript c indicate a significant predicted decrease in the probability of earning the SSSW.

* $p < .01$.

How Do Relationships Differ Across Student Characteristics?

Exhibits B3–B11 in Appendix B present the results from the analyses that looked at how the relationships differ across student characteristics. Overall, the estimated relationships indicate there were some meaningful variations in the predictive power of each CCMR indicator across student groups. For example, there were no or smaller significant differences in the predicted probabilities for female, Asian, and Black students across the CCMR indicators, including the two indicators with the strongest predictive power (i.e., aligned IBC and Level 1 or 2 Certificate). In addition, there also were no or smaller significant differences in the predicted probabilities for students with disabilities and emergent bilingual students across the CCMR indicators. However, emergent bilingual students who met the aligned IBC indicator had larger significant differences than students overall for earning the 2018 annual median wage, and students with disabilities who met the Level 1 or 2 certificate had larger significant differences than students overall for earning the 2018 annual median wage.

E. Limitations

Several limitations should be considered when interpreting the results of this study. First, the study relied on unemployment insurance wage reports to determine employment outcomes. These data are not broken out by part-time or full-time status, and individuals can be employed in multiple jobs with multiple wages in each quarter. Therefore, the study used a less restrictive definition of employment (i.e., the individual was reported in at least one quarter the year following high school graduation).[7] In addition, the physical location of employment and the job position were unknown, which did not allow us to understand the cost of living relative to wage earnings or potential gender and racial biases in the labor market. In addition, unemployment insurance wage reports exclude employment and earnings outcomes for graduates who have pursued out-of-state or federal employment, including those who enlisted in the military. Second, the sample included in the analysis for earning an SSSW was limited to high school graduates with little or no postsecondary education. Earning an SSSW may require additional education and high-quality work experience; therefore, analyzing wages within 1 year of high school graduation may be too soon. Third, the analyses assessed each CCMR indicator separately and may not reflect the strength of meeting multiple indicators. Finally, the analyses were limited to a single cohort of graduates, which has implications for the generalizability of the findings to subsequent cohorts. For example, the aligned IBC and a program-of-study completer indicator will not be reflected in the A-F Accountability System until 2027, with 2026

[7] Other research on workforce outcomes have also included a longer employment threshold when reporting income.

graduates. This phased-in approach allows districts time to implement aligned programs of study; therefore, the percentage of students achieving this indicator is likely to increase.

F. Next Steps and Future Research

CCMR indicators in high school should provide information to decision makers that ensures high school graduates transition successfully into further education, training, or employment. Typically, college and career readiness indicators have focused on college outcomes; however, becoming career ready requires a new focus on both college and workforce outcomes. In future research, we will expand these analyses by looking at other potential workforce outcomes, such as employability skills, stability, and time required to earn an SSSW. In addition, future research will explore the relationship of the indicators with regional labor market variations. Future research also will explore other indicators that may help students develop college and career readiness, such as college and career readiness school models, and participation in internships and work-based learning. Because postsecondary education is still the most direct pathway to economic success, future research will also explore outcomes beyond success in entry-level courses, such as persisting in college, credit accumulation, and degree attainment (Carnevale, et al., 2021). Future research may also explore using advanced statistical methods such as machine learning methods or latent class models to incorporate multiple measures in a CCMR standard.

For this preliminary report, we focused on the relationship between CCMR indicators and earning an SSSW. For the final report due in March 2025, we will present results on the relationship between CCMR indicators and earning a C or better in entry-level, credit-bearing courses in reading, writing, and math.

References

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college.* U.S. Department of Education. https://www2.ed.gov/rschstat/research/pubs/toolboxrevisit/toolbox.pdf

Baum, S., Holzer, H., & Luetmer, G. (2020). *Should the federal government fund short-term postsecondary certificate programs?* Urban Institute.

Carnevale, A. P., Cheah, B. and Wenzinger, E. (2021). *The college payoff: More education doesn't always mean more earnings*. Georgetown University Center on Education and the Workforce. https://cew.georgetown.edu/cew-reports/collegepayoff2021/

Center for Women's Welfare. (2023). *The self-sufficiency standard for Texas 2024*. Technical Brief. University of Washington School of Social Work. https://selfsufficiencystandard.org/texas/

Cui, W., & Bay, L. (2017). *The predictive placement validity study of Texas Success Initiative Assessment (TSIA)*. The College Board. https://reportcenter.highered.texas.gov/training-materials/presentations/crs-de-tsi-tsia-validity-study-college-board/

Cumpton, G., Schexnayder, D., King, C. T., & Stolp, C. (2012). *Factors associated with education and work after high school for the classes of 2008 and 2009: A research report of the Central Texas Student Futures project*. Ray Marshall Center for the Study of Human Resources, University of Texas at Austin. http://hdl.handle.net/2152/20410

Grossman, J., Kato, L., Mallon, T., Maguire, S., & Conway, M. (2015). *The value of credentials for disadvantaged workers: Findings from the sector employment impact study*. Aspen Institute. https://doi.org/10.13140/RG.2.1.2637.4005

Jepsen, C., Troske, K., & Coomes, P. (2014). The labor-market returns to community college degrees, diplomas, and certificates. *Journal of Labor Economics*, *32*(1), 95–121. https://doi.org/10.1086/671809

Long, M. C., Conger, D., & Iatorala, P. (2012). Effects of high school course-taking on secondary and postsecondary success. *American Educational Research Journal*, *39*(2), 285–322. https://doi.org/10.3102/0002831211431952

Smith, J., Hurwitz, M., & Avery, C. (2017). Giving college credit where it is due: Advanced placement exam scores and college outcomes. *Journal of Labor Economics*, *35*(1). https://doi.org/10.1086/687568

Texas Education Agency. (2024). *2024 accountability manual for Texas public school districts and campuses*. https://tea.texas.gov/texas-schools/accountability/academic-accountability/performance-reporting/2024-accountability-manual-full.pdf

Warne, R. T. (2017). Research on the academic benefits of the advanced placement program: Taking stock and looking forward. *SAGE Open*, *7*(1). https://doi.org/10.1177/2158244016682996

Xu, D., & Trimble, M. (2016). What about certificates? Evidence on the labor market returns to nondegree community college awards in two states. *Educational Evaluation and Policy Analysis*, *38*(2), 272–292. https://doi.org/10.3102/0162373715617827

Appendix A. Data and Methods

This appendix describes data sources, population, and analysis methods.

Data Sources

The study used deidentified, student-level, administrative data from Texas that were available through the Texas Education Agency (TEA) and the data repository at the Texas Education Research Center at The University of Texas at Austin. Data used in this study included public education information from Prekindergarten–Grade 12 schools collected by TEA; information from both public and private institutions of higher education collected by the Texas Higher Education Coordinating Board and National Student Clearinghouse; and students' Texas employment and earnings data collected through the unemployment insurance report by the Texas Workforce Commission.[8] The data also included a file of the 2021–22 graduating cohort that included the CCMR accountability standard obtained by each graduate, as calculated by staff at TEA.

Outcome Variables

Texas state average self-sufficiency standard wage (SSSW). The Texas Workforce Commission and the Ray Marshall Center at The University of Texas at Austin worked with the Center for Women's Welfare at the University of Washington to create a Texas state average SSSW. The weighted average annual SSSW was $72,117.[9] This SSSW was approved by the Tri-Agency Workforce Initiative Commissioners in 2024 (Center for Women's Welfare, 2023). To adjust the SSSW to 2022, the research team discounted 2024 wages to 2022 wages by using the reported Texas Consumer Price Index for each year. The following formula was applied:

$$(July\ 2024\ CPI\ (287.1) - July\ 2022\ CPI\ (270.4)) \div 270.4 = \mathbf{6.2\%\ reduction}$$

In 2022 dollars, the average annual SSSW used in the analysis was **$67,646.**

Given the difference in the amount of the state average SSSW and the median salary of all jobs in Texas in 2022–23, the research team also considered the annual median salary of all jobs in

[8] Although these data capture only wages reported on Form W-2, according to staff at the Texas Workforce Commission, the data capture 95% of employers in Texas. Also, military enlistment data were not available for the 2022 cohort of graduates and were not included in the analyses.

[9] As of November 2024, the Texas Workforce Commission updated the SSSW to $72,183.

Texas in 2018 ($37,099),[10] the median salary of all jobs in Texas in 2022–23 ($43,463),[11] and 125% of the 2023 median ($54,329) as alternative wage measures for comparison.

Entry-level, credit-bearing courses. This study used the credit-bearing courses used in the predictive placement validity study of the Texas Success Initiative Assessment (TSIA) conducted by the College Board (Cui & Bay, 2017). The courses are based on the Texas Common Course System, outlined in the ***Academic Course Guide Manual*** published by the Texas Higher Education Coordinating Board[12]:

Mathematics (3/4 semester credit hour (SCH) versions)

- MATH 1314/1414: College Algebra
- MATH 1324/1424: Mathematics for Business & Social Science 1
- MATH 1332/1442: Contemporary Mathematics 1
- MATH 1342/1442: Elementary Statistical Methods

Reading

- GOVT 2301: American Government I (Federal and Texas constitutions)
- GOVT 2302: American Government II (Federal and Texas Topics)
- GOVT 2305: Federal Government (Federal Constitution and Topics)
- GOVT 2306: Texas Government (Texas Constitutions and Topics)
- HIST 1301: United States History I
- HIST 1302: United States History II
- HUMA 1301: Introduction to the Humanities I
- PHIL 1301: Introduction to Philosophy
- PSYC 2301: General Psychology
- SOCI 1301: Introductory Sociology

English Composition/Writing

- ENGL 1301: Composition I
- ENGL 1302: Composition II

Covariates

As stipulated in Rider 89, the analysis included student background characteristics (i.e., gender, race/ethnicity, student with disabilities, economically disadvantaged, and emergent bilingual

[10] As reported at Texaswages.com.
[11] *Report on Texas Growth Occupations—2023* (12-14-2023). Texas Workforce Commission. https://www.twc.texas.gov/sites/default/files/ogc/mtg23/commission-meeting-material-121923-item12-txexas-growth-occupations-2023-twc.pdf
[12] The Texas Common Course Numbering System can be found at the following site: https://tccns.org/about.

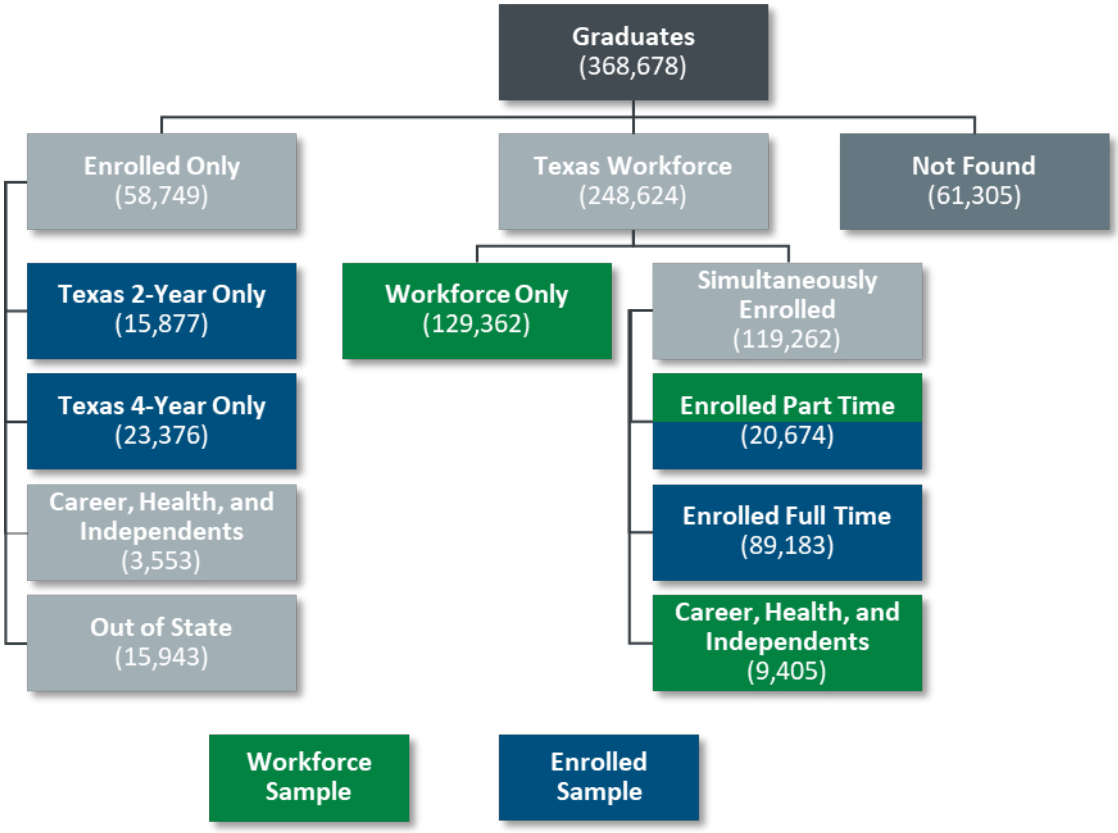
students) and high-mobility risk factors (i.e., youth in foster care, students experiencing homelessness, and migrant students). The analysis also controlled for district type (i.e., charter, city, suburban, town, rural) and education service center region.

Study Population

The study used the 2021–22 graduating cohort, the most recent cohort available, and followed that cohort 1 year after high school graduation. A graduate's initial postsecondary pathway was defined by their (a) immediate college enrollment in the fall 2022 semester following high school graduation (both in Texas colleges and out-of-state) and (b) entry into the Texas workforce within 1 year of high school graduation (i.e., reported in at least one quarter of the unemployment insurance data beginning in Quarter 3 of 2022).

The sample used to conduct the analysis of earning the SSSW included graduates who entered the workforce in any quarter within 1 year of high school graduation (i.e., Quarters 3 and 4 of 2022 and Quarters 1 and 2 of 2023). Students who were both in the workforce and enrolled part time in college were included in the sample. Students who were both in the workforce and enrolled full time were excluded from the analysis because they were likely to be working part time, which could skew the annual wage results (Exhibit A1). The sample used to conduct the analysis of entry-level, credit-bearing courses included graduates who immediately entered a Texas 2- or 4-year college during the fall semester of 2022, including students simultaneously enrolled full time and working. Students enrolled out of state or in Texas career schools or health-related institutions were not included in the sample because student-level course data are not collected for these institutions.

Exhibit A1. Flow of 2022 Graduates into Each Analytic Sample



The demographic characteristics of the graduates included in each analytic sample are presented in Exhibit A2.

Exhibit A2. Demographic Characteristics of the 2022 Graduates Included in Each Sample

Demographic characteristic	All graduates	Enrolled-in-Texas-college sample	Texas workforce sample
Total number of students (% of graduates)	**368,678 (100.0%)**	**122,837 (33.3%)**	**159,345 (43.2%)**
Gender			
Female	50.1%	57.4%	47.3%
Male	49.9%	42.6%	52.7%
Race/ethnicity			
Asian	5.1%	7.1%	2.0%
Black	12.3%	10.9%	13.9%
Hispanic	51.8%	48.9%	53.9%
Other	2.8%	2.7%	2.9%
White	28.0%	30.3%	27.3%
Student group			
Students with disabilities	8.8%	3.2%	10.5%
Emergent bilingual	11.0%	6.0%	11.1%
Economically disadvantaged	52.8%	45.3%	58.6%
Highly mobile	1.0%	0.8%	1.8%

Note. The Texas workforce sample excludes 96 employees due to data entry errors in the UI data. The enrolled-in-Texas sample excludes 26,273 students who did not have an entry-level, credit-bearing course in mathematics, reading, or writing during the fall 2022 or spring 2023 semesters and those enrolled in career, health, and independent colleges because course-level information is not collected for these institutions.

Analysis

Research Questions 1 and 2 measured the extent to which the nine CCMR indicators were predictive of earning an SSSW or earning a grade of C or higher in an entry-level, credit-bearing course in math, reading, and writing. To assess the strength and direction of the relationship between each CCMR indicator and the outcomes, the research team modeled the effect of earning a CCMR indicator on the outcome using separate multilevel logistic regression models for each indicator. To account for regional differences in access to employment opportunities that pay an SSSW, student observations were nested within state geographic regions. For each model, the main effect of interest was the predicted probability that students who met each CCMR indicator earned each of the postsecondary outcomes (i.e., earned each of the wage thresholds or earned a grade C or higher in an entry level course). We used the following

multilevel logistic regression model to estimate the relationship between a CCMR indicator and earning a wage:

$$logit(Y_{ij}) = \beta_{0ij} + \beta_1 X_{ij} + \beta_2 \mathbf{\Phi}_{ij} + \beta_3 \mathbf{Z_j}$$

Where Y represents the binary indicator for whether graduate i in region j met each postsecondary outcome (Y=1) or not (Y=0), X represents a binary indicator (met/not met) for each of the nine CCMR indicators, $\mathbf{\Phi}$ is a vector of student covariates, including student sex, race/ethnicity, emergent bilingual status, student with disability status, economically disadvantaged status, and highly mobile status,[13] and $\boldsymbol{Z}$ is a vector of region level aggregates of student covariates. To aid in model interpretation, student level covariates were centered within region and region level aggregates were centered at the grand mean. In the main effect models, the effect of interest was the effect of earning the CCMR indicator on earning a self-sufficiency standard wage aggregated across model covariates. The team fit a separate model for each CCMR indicator for a total of nine models.

To examine whether this effect was moderated by student characteristic or district type (research question 3), the research team added an indicator-by-covariate interaction to the multilevel logistic regression models. In these models, the effect of each CCMR indicator on earning a self-sufficiency standard wage is computed separately for each student group and district type.

Prior to reporting, the team transformed the effects from log odds into predicted probabilities *(pp)* using the following equation.

$$pp = \frac{e^{\ln(odds)}}{(1 + e^{\ln(odds)})}$$

The predicted probability of earning the outcome for those who did not meet the indicator (pp_0) and the predicted probability of earning the outcome for those who met the indicator (pp_1) were each estimated using the empirical distribution of the observed data. For this reason, pp_0 and pp_1 are weighted averages which give more weight to the combinations of covariates most commonly observed among those who did not meet the indicator or met the indicator, respectively. Delta_pp uses a counterfactual data distribution which does not weigh observations in the same manner. For this reason, delta_pp may not equal the difference between the values reported for pp_0 and pp_1.

[13] Students who are indicated as highly mobile included students experiencing homelessness, migrant students, or students in foster care.

Appendix B. Supporting Analyses

This appendix provides results from supporting analyses.

Exhibits B1 and B2 are supplements to Exhibit 4 in the main report. These tables show the initial postsecondary pathways of 2022 graduates by student demographics and region of the state.

Exhibit B1. Initial Postsecondary Pathway for 2022 Graduates, by Student Demographics

Student demographics	2022 graduate count	Texas 2-year	Texas 4-year	Enrolled out of state	Texas workforce only	In Texas workforce and enrolled	Not found
Total number	368,678	4.3%	7.3%	4.3%	35.1%	32.3%	16.6%
Gender							
Female	184,575	4.3%	7.8%	4.9%	31.8%	36.9%	14.6%
Male	184,103	4.3%	6.8%	4.1%	38.4%	27.8%	18.6%
Race/ethnicity							
Asian	18,794	4.6%	19.5%	15.0%	11.7%	35.3%	13.9%
Black	45,224	2.8%	5.7%	3.9%	41.3%	31.0%	15.3%
Hispanic	191,121	5.1%	6.1%	3.7%	36.1%	31.1%	17.8%
Other	10,369	3.8%	6.9%	3.8%	37.3%	29.2%	18.3%
White	103,170	3.6%	7.5%	3.8%	34.6%	35.0%	15.3%
Student group							
Students with disabilities	32,445	5.2%	1.8%	1.5%	44.9%	14.7%	31.4%
Emergent bilingual	40,395	5.1%	2.3%	7.7%	36.1%	19.6%	28.7%
Economically disadvantaged	194,565	4.6%	4.8%	3.4%	39.8%	29.0%	17.8%
Highly mobile	3,738	2.5%	2.5%	3.5%	47.1%	24.5%	19.6%
District type							
Charter school	17,791	4.3%	9.2%	2.7%	35.8%	31.0%	17.0%
City	136,568	4.1%	7.4%	5.0%	34.7%	31.4%	17.4%
Rural	54,920	4.3%	6.7%	1.8%	37.1%	35.1%	15.0%
Suburb	124,429	4.5%	7.8%	5.8%	32.7%	32.6%	16.6%
Town	34,970	4.3%	5.3%	1.2%	41.7%	31.6%	15.9%

Note. Percentages may not total 100% due to rounding and suppression of small sample sizes.

Exhibit B2. Initial Postsecondary Pathway for 2022 Graduates, by Education Service Center Region

Education service center region	2022 graduate count	Texas 2-year	Texas 4-year	Enrolled out of state	Texas workforce only	In Texas workforce and enrolled	Not found
Total	368,678	4.3%	7.3%	4.3%	35.1%	32.3%	16.6%
1 (Edinburg)	29,451	6.4%	11.8%	2.6%	28.1%	32.8%	18.2%
2 (Corpus Christi)	6,606	4.3%	8.3%	0.9%	37.4%	34.3%	14.8%
3 (Victoria)	3,251	5.7%	5.5%	1.3%	40.0%	35.0%	12.5%
4 (Houston)	82,541	5.2%	8.2%	6.8%	30.6%	31.2%	18.0%
5 (Beaumont)	5,169	3.4%	7.1%	1.4%	38.3%	35.4%	14.3%
6 (Huntsville)	14,387	4.7%	6.2%	4.3%	35.8%	31.5%	17.4%
7 (Kilgore)	12,430	5.0%	4.5%	1.1%	39.5%	34.1%	15.8%
8 (Mount Pleasant)	3,579	4.6%	4.5%	0.8%	39.5%	32.5%	18.0%
9 (Wichita Falls)	2,382	2.9%	6.0%	1.1%	41.0%	34.3%	14.7%
10 (Richardson)	59,717	3.4%	6.6%	5.9%	35.9%	30.7%	17.4%
11 (Fort Worth)	42,772	2.6%	5.8%	5.1%	40.2%	29.4%	16.8%
12 (Waco)	11,027	4.9%	5.1%	1.7%	40.0%	32.7%	15.5%
13 (Austin)	26,030	2.4%	7.2%	4.7%	38.3%	31.2%	16.1%
14 (Abilene)	3,579	3.5%	6.3%	1.0%	41.3%	34.6%	13.2%
15 (San Angelo)	3,394	2.9%	8.5%	0.6%	39.7%	35.4%	12.9%
16 (Amarillo)	5,412	3.2%	3.7%	1.6%	37.9%	40.7%	12.7%
17 (Lubbock)	5,464	2.9%	4.8%	0.8%	42.7%	35.4%	13.5%
18 (Midland)	5,170	3.2%	4.6%	2.2%	44.5%	32.4%	12.9%
19 (El Paso)	12,934	6.4%	9.8%	2.0%	27.9%	38.1%	15.8%
20 (San Antonio)	33,383	4.9%	7.4%	2.8%	34.2%	35.9%	14.8%

Note. Percentages may not total 100% due to rounding and suppression of small sample sizes.

Exhibits B3 through B11 are supplements to Exhibit 5 in the main report. These tables show the predicted probabilities of earning each wage threshold by student characteristics for each CCMR indicator.

Exhibit B3. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *AP/IB* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.4	0.4	-0.0	6.2	4.1	[a]**-2.1***	3.4	2.4	[a]**-1.0***	1.3	1.1	-0.2
Female	0.2	0.2	-0.0	2.2	2.0	-0.0	1.1	1.2	0.2	0.4	0.5	0.2
Male	0.7	0.5	-0.1	9.9	5.2	[a]**-4.4***	5.6	3.1	[a]**-2.3***	0.02	1.4	-0.6
Asian	0.4	1.0	0.7	4.6	2.7	-0.9	2.6	2.1	0.1	1.2	1.2	0.4
Black	0.2	0.1	-0.1	2.5	1.6	-0.4	1.3	0.8	-0.2	0.5	0.4	0.0
Hispanic	0.5	0.4	-0.0	7.6	4.8	-1.4	4.2	2.8	-0.6	1.5	1.2	-0.3
Other	0.2	0.0	-0.2	4.6	1.4	[a]**-2.7***	2.3	0.6	[a]**-1.5***	0.5	0.4	0.0
White	0.4	0.2	-0.2	6.4	2.1	[a]**-3.6***	3.5	1.3	[a]**-1.8***	1.4	0.6	[a]**-0.6***
Students with disabilities	0.3	0.8	0.4	3.3	7.4	3.0	3.6	1.9	1.7	0.9	1.6	0.7
Emergent bilingual	0.6	0.3	-0.2	10.0	6.7	-1.3	5.5	3.5	-1.0	2.0	1.6	0.1
Economically disadvantaged	0.4	0.3	-0.1	6.4	4.8	-0.8	3.5	2.7	-0.3	1.3	1.0	-0.1
Highly mobile	0.5	0.6	0.1	5.3	6.0	0.8	3.2	3.4	0.4	1.1	1.3	0.3

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] Values in dark red preceded by superscript a indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B4. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *TSI* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.5	0.4	-0.0	6.6	4.9	[b]**-1.7***	3.6	2.8	[b]**-0.8***	1.3	1.1	[b]**-0.2***
Female	0.2	0.2	-0.0	2.3	2.0	-0.0	1.1	1.0	-0.1	0.4	0.4	-0.0
Male	0.7	0.6	-0.1	10.6	7.3	[b]**-3.1***	5.9	4.3	[b]**-1.5***	2.1	1.7	[b]**-0.4***
Asian	0.2	1.0	[a]**0.9***	4.9	3.1	-0.8	2.6	2.3	0.3	1.0	1.4	0.6
Black	0.2	0.2	-0.0	2.6	2.2	-0.3	1.3	1.2	-0.1	0.5	0.4	-0.1
Hispanic	0.5	0.5	-0.1	7.8	6.0	[b]**-1.4***	4.3	3.5	[b]**-0.7***	1.5	1.4	-0.1
Other	0.2	0.1	-0.1	4.4	3.7	-0.6	2.1	2.1	-0.0	0.5	0.5	-0.2
White	0.5	0.3	[b]**-0.2***	7.1	3.9	[b]**-2.9***	3.9	2.1	[b]**-1.6***	1.5	0.8	[b]**-0.6***
Students with disabilities	0.4	0.5	0.0	4.6	6.0	0.6	2.6	3.3	0.3	1.1	1.2	-0.0
Emergent bilingual	0.6	0.6	0.1	10.0	8.6	-1.1	5.5	4.8	-0.5	1.9	2.0	0.1
Economically disadvantaged	0.4	0.4	-0.3	6.6	5.5	[b]**-1.0***	3.6	3.1	[b]**-0.5***	1.3	1.2	-0.1
Highly mobile	0.5	0.6	0.1	5.5	4.8	-0.9	3.3	2.9	-0.6	1.2	0.8	-0.4

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] The value in dark blue preceded by superscript a indicate a significant predicted increase in the probability of earning the wage threshold.

[b] Values in dark red preceded by superscript b indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B5. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *Dual Credit* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.4	0.5	0.1	6.1	6.0	-0.1	3.3	3.4	0.0	1.2	1.4	0.1
Female	0.2	0.2	-0.0	2.2	2.4	0.3	1.1	1.2	0.2	0.4	0.4	0.0
Male	0.6	0.8	0.2	9.7	8.9	-0.6	5.4	5.3	-0.1	2.0	2.3	0.3
Asian	0.5	1.2	0.9	4.0	3.4	0.2	2.3	2.7	1.0	1.0	1.8	1.1
Black	0.2	0.0	[a]**-0.2***	2.5	2.5	0.6	1.3	1.2	0.2	0.5	0.3	-0.1
Hispanic	0.5	0.6	0.1	7.5	6.5	0.5	4.2	3.7	0.4	1.5	1.5	0.3
Other	0.2	0.0	-0.2	4.0	4.9	1.7	2.1	2.0	0.3	0.5	0.4	0.0
White	0.4	0.4	0.0	6.2	4.1	[a]**-1.4***	3.4	2.3	[a]**-0.7***	1.3	1.0	-0.1
Students with disabilities	0.4	1.1	0.5	5.4	8.4	2.2	3.0	3.5	0.1	1.1	2.0	0.6
Emergent bilingual	0.6	0.8	0.3	9.7	10.6	1.7	5.4	5.8	0.8	1.9	2.1	0.4
Economically disadvantaged	0.4	0.5	0.1	6.4	6.1	0.7	3.5	3.5	0.5	1.2	1.4	0.3
Highly mobile	0.5	0.7	0.3	5.5	4.1	-0.1	3.2	2.9	0.5	1.1	1.0	0.2

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] Values in dark red preceded by superscript a indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B6. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *AA Degree* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.4	0.5	0.1	6.1	6.6	0.6	3.3	3.9	0.6	1.3	1.4	0.1
Female	0.2	0.3	0.1	2.2	3.1	1.2	1.1	1.9	0.9	0.4	0.6	0.2
Male	0.6	0.7	0.1	9.6	8.6	-0.7	5.4	4.9	-0.3	2.0	1.9	-0.1
Asian	0.7	0.0	[a]**-0.7***	3.9	1.7	-2.1	2.4	1.7	-0.6	1.2	1.8	0.6
Black	0.2	0.0	[a]**-0.2***	2.5	2.3	0.8	1.3	1.0	0.2	0.5	0.0	[a]**-0.5***
Hispanic	0.5	0.6	0.3	7.4	5.9	1.1	4.1	3.5	0.9	1.5	1.4	0.5
Other	0.2	0.0	-0.2	4.1	8.2	5.5	2.0	4.3	3.1	0.5	0.0	[a]**-0.5***
White	0.4	0.2	-0.1	5.7	3.7	-1.1	3.1	2.3	-0.2	1.2	0.5	-0.6
Students with disabilities	0.4	0.2	-0.2	5.5	0.5	[a]**-4.9***	3.0	0.5	-2.4	1.1	0.3	-0.7
Emergent bilingual	0.6	0.5	0.0	9.8	6.3	-2.2	5.4	2.3	-2.5	1.9	1.4	-0.2
Economically disadvantaged	0.4	0.3	-0.1	6.4	5.7	1.1	3.5	3.1	0.7	1.3	1.1	0.3
Highly mobile	0.5	0.0	[a]**-0.5***	5.3	10.3	9.9	3.2	5.2	4.6	1.1	0.1	-1.0

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] Values in dark red preceded by superscript a indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B7. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *OnRamps* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.4	0.4	0.0	6.1	4.9	[a]**-1.2***	3.4	2.6	[a]**-0.8***	1.3	1.1	-0.2
Female	0.2	0.2	0.0	2.2	2.4	0.3	1.1	1.2	0.1	0.4	0.5	0.1
Male	0.6	0.6	-0.0	9.6	6.8	[a]**-2.8**	5.4	3.6	[a]**-1.8**	2.0	1.6	-0.4
Asian	0.7	0.0	[a]**-0.7***	3.9	2.8	-1.0	2.4	2.2	-0.1	1.3	0.0	[a]**-1.9***
Black	0.2	0.4	0.3	2.5	2.3	0.1	1.3	1.2	0.1	0.5	0.4	-0.0
Hispanic	0.5	0.4	-0.0	7.4	5.1	-1.1	4.1	2.7	-0.7	1.5	1.2	-0.0
Other	0.2	0.0	-0.2	4.1	3.9	0.3	2.1	0.8	-1.2	0.5	0.0	[a]**-0.5***
White	0.4	0.4	0.1	5.8	3.8	[a]**-1.6***	3.2	1.9	[a]**-1.1***	1.2	0.9	-0.2
Students with disabilities	0.4	4.2	3.7	4.2	8.8	2.9	2.2	5.0	1.9	0.9	4.3	3.2
Emergent bilingual	0.6	1.8	1.5	9.8	9.6	0.5	5.4	5.2	0.4	1.9	3.0	1.5
Economically disadvantaged	0.4	0.6	0.2	6.4	4.8	-0.9	3.5	2.6	-0.5	1.3	1.3	0.3
Highly mobile	0.5	0.1	-0.4	5.3	5.9	1.4	3.2	3.1	0.5	1.1	0.0	[a]**-1.1***

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] Values in dark red preceded by superscript a indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B8. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *Aligned IBC* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.4	0.6	[a]**0.2***	5.8	8.1	[a]**3.0***	3.2	4.9	[a]**1.7***	1.2	1.9	[a]**0.7***
Female	0.2	0.1	-0.0	2.2	2.4	0.0	1.1	1.0	-0.1	0.4	0.4	-0.0
Male	0.6	1.2	[a]**0.6***	9.1	15.2	[a]**5.4***	5.1	9.0	[a]**3.3***	1.9	3.5	[a]**1.4***
Asian	0.7	0.0	[b]**-0.7***	3.6	6.5	3.6	2.4	2.8	0.7	1.3	0.0	[b]**-1.3***
Black	0.2	0.1	-0.1	2.4	4.0	1.9	1.3	1.5	0.3	0.5	0.4	-0.0
Hispanic	0.5	0.6	0.2	7.2	9.0	[a]**2.5***	4.0	5.3	[a]**1.6***	1.4	2.1	[a]**0.7***
Other	0.1	0.4	0.3	3.8	8.6	[a]**4.8***	1.9	4.7	2.8	0.5	0.9	0.4
White	0.3	1.1	[a]**0.6***	5.3	10.3	[a]**4.4***	2.9	5.8	[a]**2.4***	1.1	2.4	[a]**1.1***
Students with disabilities	0.7	0.7	0.2	9.0	8.6	2.5	5.1	4.9	1.4	2.0	1.6	0.3
Emergent bilingual	0.6	0.8	0.2	9.5	12.8	[a]**3.3***	5.4	7.3	1.9	1.9	2.8	0.8
Economically disadvantaged	0.4	0.7	0.2	6.1	8.9	[a]**2.6***	3.3	5.1	[a]**1.5***	1.2	1.9	[a]**0.6***
Highly mobile	0.4	2.0	1.4	5.1	9.4	4.1	2.9	7.9	[a]**4.5***	1.0	2.8	1.5

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] Values in dark blue preceded by superscript a indicate a significant predicted increase in the probability of earning the wage threshold.

[b] Values in dark red preceded by superscript b indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B9. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *Level 1 or 2 Certificate* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.4	1.1	[a]**0.7***	6.0	13.2	[a]**7.3***	3.3	8.0	[a]**4.7***	1.2	3.3	[a]**2.1***
Female	0.2	0.0	[b]**-0.2***	2.2	6.1	[a]**3.4***	1.1	2.7	1.3	0.4	0.5	0.1
Male	0.6	2.3	[a]**1.5***	9.4	22.4	[a]**10.8***	5.3	14.7	[a]**7.6***	2.0	6.7	[a]**3.8***
Asian	0.7	0.0	[b]**-0.7***	3.7	17.1	10.4	2.4	8.3	4.3	1.2	8.3	5.1
Black	0.2	0.0	[b]**-0.2***	2.5	6.0	4.4	1.3	4.9	4.3	0.5	1.2	0.9
Hispanic	0.5	1.9	[a]**1.1***	7.2	16.6	[a]**7.1***	4.0	10.8	[a]**5.0***	1.5	4.7	2.3
Other	0.2	0.0	-0.2	4.1	4.7	-0.7	2.1	0.0	-2.1	0.5	0.0	-0.5
White	0.4	0.4	-0.1	5.6	23.2	[a]**11.9***	3.1	13.0	[a]**6.4***	1.2	5.8	2.9
Students with disabilities	0.4	1.0	0.4	5.4	16.9	[a]**8.5***	2.9	10.3	5.1	1.1	5.5	3.1
Emergent bilingual	0.6	0.8	0.1	9.7	18.3	6.2	5.3	10.1	3.1	1.9	5.0	2.2
Economically disadvantaged	0.4	1.3	0.6	6.2	16.6	[a]**6.8***	3.4	10.4	[a]**4.5***	1.2	4.6	[a]**2.1***
Highly mobile	0.5	0.0	[b]**-0.5***	5.4	0.0	[b]**-5.4***	3.2	0.0	[b]**-3.2***	1.1	0.0	[b]**-1.1***

Note. N = 159,345. SSSW = Self-sufficiency standard wage.

[a] Values in dark blue preceded by superscript a indicate a significant predicted increase in the probability of earning the wage threshold.

[b] Values in dark red preceded by superscript b indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B10. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *Advanced Diploma* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.3	0.4	0.1	4.4	5.9	**[a]1.4***	2.3	3.1	**[a]0.8***	0.9	1.2	0.3
Female	0.3	0.3	-0.0	1.6	2.0	0.4	1.0	1.1	0.1	0.5	0.3	-0.2
Male	0.3	0.6	0.2	5.9	8.2	**[a]2.0***	3.0	4.4	**[a]1.2***	1.0	1.7	0.6
Asian	0.0	0.0	0.0	3.6	1.5	-2.0	0.0	0.0	0.0	0.0	0.0	0.0
Black	0.2	0.1	-0.1	2.0	2.3	0.4	1.0	1.3	0.3	0.5	0.6	0.1
Hispanic	0.3	0.5	0.2	5.6	7.6	**[a]2.3***	3.0	4.2	**[a]1.4***	1.0	1.4	0.4
Other	0.0	0.4	0.4	1.3	6.6	**[a]5.1***	0.0	2.0	2.0	0.0	0.4	0.4
White	0.4	0.6	0.1	4.9	5.1	0.3	2.6	2.6	0.7	1.0	1.2	0.3
Emergent bilingual	0.5	0.7	0.2	7.7	10.0	2.9	4.0	5.2	1.3	1.4	2.1	0.7
Economically disadvantaged	0.3	0.4	0.1	4.3	5.8	**[a]1.4***	2.2	3.1	0.8	0.9	1.1	0.2
Highly mobile	0.5	0.0	-0.6	3.4	5.1	1.2	1.7	4.1	2.0	1.1	1.0	-0.2

Note. N = 16,662. SSSW = Self-sufficiency standard wage. Indicator applies only to students with disabilities.

[a] Values in dark blue preceded by superscript a indicate a significant predicted increase in the probability of earning the wage threshold.

* $p < .01$.

Exhibit B11. Predicted Probability of Earning a Self-Sufficiency Wage for Students Who Met and Did Not Meet the *Workforce Readiness* Indicator, by Student Characteristics

Student characteristic	2022 SSSW ($67,646)			2018 annual median wage ($37,099)			2022–23 median wage ($43,463)			125%*(2022–23 median wage) ($54,329)		
	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}	PP_0	PP_1	Δ_{pp}
Total	0.5	0.2	[a]**-0.3***	5.8	4.0	[a]**-1.7***	3.1	1.9	-1.2	1.2	0.8	-0.4
Female	0.3	0.2	-0.1	2.0	1.3	-0.6	1.1	0.9	-0.2	0.4	0.3	-0.1
Male	0.2	0.6	[a]**-0.4***	8.0	5.3	[a]**-2.3***	4.4	2.4	[a]**-1.8***	1.6	1.0	-0.6
Asian	0.0	0.0	-0.0	0.0	7.8	7.2	0.0	0.0	0.0	0.0	0.0	0.0
Black	0.2	0.2	0.1	2.2	2.1	-0.1	1.1	1.2	0.1	0.6	0.5	-0.1
Hispanic	0.5	0.1	[a]**-0.4***	7.5	5.0	[a]**-2.7***	4.2	2.5	[a]**-1.8***	1.4	0.8	-0.6
Other	0.3	0.0	-0.3	4.6	4.1	-0.6	1.6	0.0	-1.6	0.3	0.0	-0.3
White	0.6	0.3	-0.3	5.4	3.8	-1.5	3.0	1.7	-1.2	1.2	0.9	-0.3
Emergent bilingual	0.9	0.0	[a]**-0.9***	10.0	6.9	[a]**-3.3***	5.1	3.8	-1.4	2.3	0.5	[a]**-1.8***
Economically disadvantaged	0.4	0.2	-0.3	5.7	4.0	[a]**-1.5***	3.0	1.9	[a]**-1.0***	1.1	0.7	-0.4
Highly mobile	0.0	0.9	0.9	4.1	4.8	0.7	2.5	3.8	1.3	0.7	1.9	1.2

Note. N = 16,662. SSSW = Self-sufficiency standard wage. Indicator applies only to students with disabilities.

[a] Values in dark red preceded by a superscript a indicate a significant predicted decrease in the probability of earning the wage threshold.

* $p < .01$.

About the American Institutes for Research®

Established in 1946, the American Institutes for Research® (AIR®) is a nonpartisan, not-for-profit institution that conducts behavioral and social science research and delivers technical assistance both domestically and internationally in the areas of education, health, and the workforce. AIR's work is driven by its mission to generate and use rigorous evidence that contributes to a better, more equitable world. With headquarters in Arlington, Virginia, AIR has offices across the U.S. and abroad. For more information, visit AIR.ORG.

AIR® Headquarters
1400 Crystal Drive, 10th Floor
Arlington, VA 22202-3289
+1.202.403.5000 | **AIR.ORG**

26509_1/25