What School-to-Workforce Pathways Are Washington Students Taking After High School?

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As part of the Sequences to Success in Washington State project, MDRC collaborated with the Washington Student Achievement Council (WSAC) to map the most common pathways after high school among Washington state public high school students who entered ninth grade in 2013 and graduated in 2017. This infographic presents the initial findings. In summary, the team identified 12 pathways. Fewer than a fifth of students are following the once-normative pathway (#8) that leads from high school directly to a four-year bachelor's degree program and into the workforce.

Students are embarking on a variety of postsecondary journeys, many that include enrolling at community and technical colleges. But the most-traveled pathway is that taken by students who enrolled in college but left before earning a credential. Increasing credential attainment among this group could have an outsized effect on overall credential attainment rates. The wide range in earnings for each pathway suggests that program of study matters a lot and that multiple pathways can lead to better labor market outcomes.

A Few Notes About This Infographic

Definition of "pathway": The term "pathway" in this document refers to a group of school-to-work trajectories for individual students that are similar enough in institution type, length of enrollment, credential type, and time to credential completion that the research team's analytic technique has clustered them together. This definition is not to be confused with other uses of "pathways" in the school-to-work literature.

Observation period: The follow-up period covers only 6.5 years following high school graduation. This may not be sufficient time to fully capture credential attainment, as some students may take longer than 6.5 years to complete college.[1] Similarly, labor market outcomes are captured starting 5.5 years after high school graduation for the 2023 calendar year only. Students who take longer to earn their credentials may be less likely to have found employment by the end of the observation period than students who earn their credentials sooner.

Workforce activity: When they leave college, either because they graduate or because they stop attending, students are presumed to enter the workforce (that is, to be employed or seeking employment). However, some people who are not employed may be engaged in activities not captured in the data (for example, caregiving) or may simply not be seeking employment.

Other types of education and training: The pathways are constructed based on college enrollment, as data on other types of noncredit enrollment and credentials were not available to the research team.

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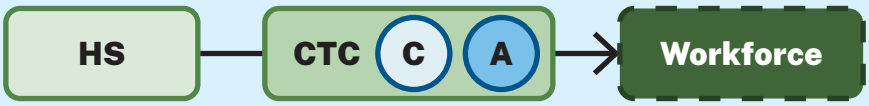
1. See National Student Clearinghouse Research Center, "Yearly Progress and Completion" (website: https://nscresearchcenter.org/yearly-progress-and-completion/2025).

How to Read These Pathway Diagrams

The visuals below depict the 12 post–high school pathways the analyses identified based on students' patterns of college enrollment length, institution type (community and technical college versus four-year college or university), and credential attainment. Each visual uses a sequence of symbols to form a miniature diagram.

For example, the visual below depicts **Pathway 4: Stacked CTC Credentials** and indicates that a student graduated from high school (HS), entered a community and technical college (CTC) and earned a certificate (C) and associate's degree (A), and then entered the Washington workforce (Workforce).



The symbols in this sequence can be interpreted as follows:

Student graduates from high school

Student enrolls at a community or technical college

Student enrolls at a four-year college or university

Student is presumed to be in the workforce (as opposed to education/training)

Student earns certificate

Student earns associate's degree

Student earns bachelor's degree

Student accumulates substantial college credit during high school through a dual credit program, enabling early credential attainment

Student completes a credential later in the observation window than students in comparable patterns

Dashed lines (circular or rectangular) indicate that only some students on the pathway engage in the activity or earn the credential.

The 12 Pathways, by Institution Type

Because institution type ended up being an important factor for the clustering of trajectories into pathways, the research team grouped the pathways into four groups based on institution type: No Enrollment or Stopped Out, Community and Technical College Enrollment, Four-Year College and University Enrollment, and Mixed Enrollment. The table below shows the percentage of students on each pathway and in each of the four groups the research team identified. The No Enrollment or Stopped Out group is the largest and makes up nearly half of the students. The Mixed Enrollment group is the smallest, representing only 6 percent of the students. A third of the students enrolled at a four-year college or university in pursuit of a bachelor's degree, and 11 percent enrolled at community and technical colleges in pursuit of certificates, associate's degrees, applied bachelor's degrees, or all three.

Pathway and Group Percentages

		Percentage
	Group 1: No Enrollment or Stopped Out	**49.0**
1	No College Enrollment	20.1
2	Some College, No Credential	28.9
	Group 2: Community and Technical College Enrollment	**11.4**
3	Certificate	1.7
4	Stacked Certificate and Associate's Degree	1.4
5	Associate's Degree	4.3
6	Dual Credit to Associate's Degree	1.1
7	Associate's Degree with Later Completion	2.9
	Group 3: Four-Year College and University Enrollment	**33.7**
8	Bachelor's Degree	19.3
9	Dual Credit to Bachelor's Degree	4.2
10	Bachelor's Degree with Later Completion	10.2
	Group 4: Mixed Enrollment	**6.0**
11	CTC-to-Four-Year Transfer	5.1
12	Other College Enrollment Patterns	0.9

SOURCES: MDRC calculations using Washington State Education Research and Data Center administrative data.

12 School-to-Work Pathways

Pathway #1

No College Enrollment (20%, ~12,800 students)

HS → Workforce

After graduating from high school, students on this pathway do not enroll in college (neither community and technical colleges nor four-year colleges and universities) during the 6.5-year observation window. Many enter the Washington workforce shortly after graduation; others engage in activities not captured in the data (for example, caregiving, gig work, or the military).

Ever Employed	Stably Employed[2]	Annual Earnings Range (25th-75th Percentile)
66%	49%	Median: $42K $32K – $55K

Pathway #2

Some College, No Credential (29%, ~18,500 students)

HS → CTC/4-YR → Workforce

Students on this most traveled of the pathways enroll in postsecondary education or training but stop attending before earning a credential during the observation window. Many enroll for multiple terms and most enroll at community colleges, though around a quarter enroll at four-year colleges or universities.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
69%	50%	Median: $42K $32K – $55K

Pathway #3

Certificate (2%, ~1,100 students)

HS → CTC (C) → Workforce

Students on this pathway enroll in community and technical colleges, where they earn certificates. This pathway is one of the least traveled but has the highest employment rate and median earnings among the CTC pathways.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
80%	65%	Median: $50K $37K – $68K

2. "Stably employed" indicates employment in all four quarters of 2023, with earnings of at least $14,000. The twenty-fifth percentile, median, and seventy-fifth percentile annual earnings are reported only among those stably employed. See the Technical Notes at the end for more information.

12 School-to-Work Pathways (cont.)

Pathway #4

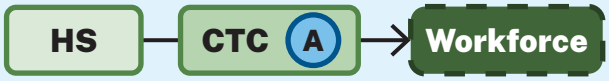
Stacked Certificate & Associate's Degree (1%, ~900 students)

Students on this pathway enroll at community and technical colleges, where they earn both certificates and associate's degrees, often in related programs. Some of the most common program areas for these stacked credentials include machine tool technology, medical assistantship, and nursing. A smaller subset of students on the pathway combined associate's degrees in liberal arts with certificates in health programs. Like Pathway 3, this pathway is also less traveled and has higher median earnings compared with other CTC pathways.

Ever Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
76%	62%	Median: $49K $37K – $67K

Pathway #5

Associate's (4%, ~2,800 students)



Students on this pathway enroll in community and technical colleges where they earn associate's degrees. They enroll for about 10 quarters on average (with a median also of 10 quarters) before earning their credentials.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
76%	58%	Median: $43K $32K – $58K

Pathway #6

Dual Credit to Associate's Degree (1%, ~700 students)

Students on this pathway earn substantial amounts of college credit while in high school through dual credit programs such as Running Start. These students either complete associate's degrees while still in high school or earn them after only a few terms of enrollment at a community and technical college. In fact, on average, it takes students on this pathway only around one quarter to earn an associate's degree after high school graduation.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
65%	49%	Median: $43K $31K – $59K

12 School-to-Work Pathways (cont.)

Pathway #7

Associate's Degree with Later Completion (3%, ~1,800 students)

Students on this pathway also attend community and technical colleges, like those on pathways 3 through 6, but they enroll for more quarters (17 on average). About 13 percent of students in this group earn their credentials before the end of the 6.5-year observation window, and others are still enrolled as of the end of this study window. Some in this latter group are likely to go on to earn their credentials within the next few years.

Ever Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
78%	57%	Median: $43K $30K – $64K

Pathway #8

Bachelor's Degree (19%, ~12,300 students)

Students on this pathway enroll at four-year institutions where they earn their bachelor's degrees after being enrolled for an average of about 15 quarters (about four to five calendar years). This pathway is the third most traveled of the 12. It is also associated with the highest median earnings.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
61%	44%	Median: $60K $43K – $81K

Pathway #9

Dual Credit to Bachelor's Degree (4%, ~2,700 students)

Students on this pathway use dual credit opportunities to earn their associate's degrees in high school. After high school, they enroll at four-year institutions, where they earn their bachelor's degrees at an accelerated pace, typically within three years but sometimes in as little as one year. This pathway has some of the strongest labor market outcomes.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
70%	53%	Median: $59K $43K – $79K

12 School-to-Work Pathways (cont.)

Pathway #10

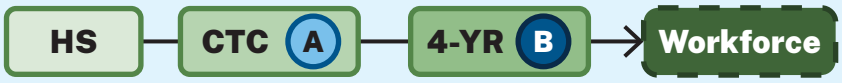
Bachelor's Degree with Later Completion (10%, ~6,500 students)

Students on this pathway enroll at four-year institutions but have longer periods of enrollment compared with the two other four-year pathways (8 and 9). Just over half of students on this pathway earn their bachelor's degrees within 6.5 years after graduating from high school, taking about 19 quarters on average to complete the credential. Other students on this pathway remain enrolled at the end of the study period, and some of them are likely to complete their bachelor's degrees within the next few years.

Ever Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
67%	45%	Median: $45K $32K – $64K

Pathway #11

CTC-to-Four-Year Transfer (5%, ~3,200 students)



Students on this pathway enroll in community and technical colleges where they earn associate's degrees. They then enroll in four-year institutions where they earn bachelor's degrees. By the end of the 6.5-year observation window, two in three students on this pathway have completed bachelor's degrees.

Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
73%	48%	Median: $45K $31K – $63K

Pathway #12

Other College Enrollment Patterns (1%, ~500 students)

This pathway, the least traveled, represents students who take one of several other, different routes to postsecondary education. Many of them have complex journeys that shift between CTCs and four-year institutions. For example, some students on this pathway attend four-year institutions and then switch to CTCs. Others earn applied bachelor's degrees at CTCs. Many earn certificates that lead to associate's degrees that in turn lead to bachelor's degrees. By the end of the 6.5-year observation window, just under 90 percent of students on this pathway have completed bachelor's degrees.

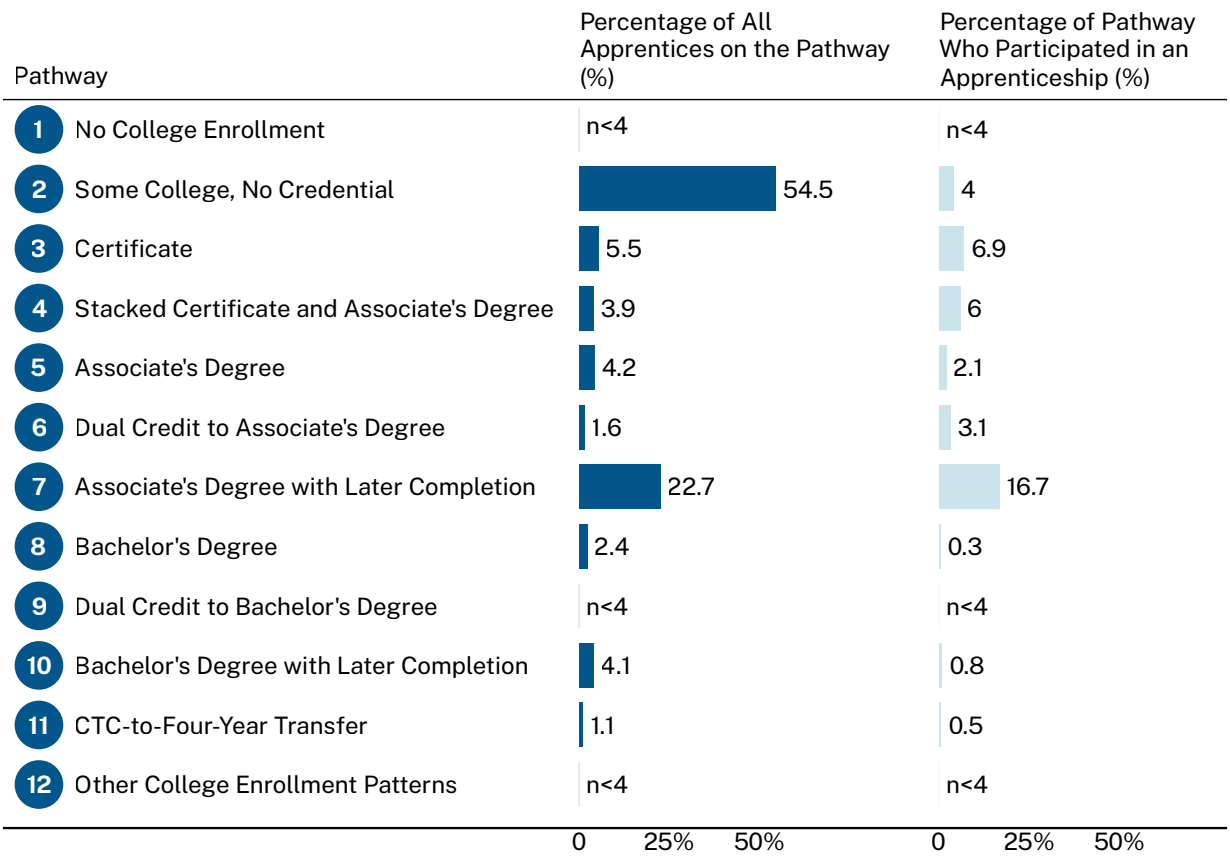
Employed	Stably Employed	Annual Earnings Range (25th-75th Percentile)
75%	56%	Median: $54K $40K – $73K

How Do Registered Apprenticeships Combine with the Pathways?

Many policymakers and researchers have begun to focus on apprenticeships as an efficient route to a well-paid career.[3] Registered apprenticeships are those that are officially documented with Washington's Apprenticeship Registration and Tracking System (ARTS), hosted by the Washington State Apprenticeship and Training Council (WSATC) and administered by the Washington State Department of Labor and Industries. Apprentices, or students who participate in registered apprenticeship programs, are found on all the pathways described in this project except Pathway 1: No College Enrollment, and over half of them are concentrated on the Some College, No Credential pathway (Pathway 2). Over half of these 738 students enrolled in registered apprenticeships through a community or technical college and the remainder enrolled in registered apprenticeships outside the CTC system. Importantly, apprenticeships are not necessarily a quick alternative to a longer credential. Students in this study who completed an apprenticeship required more than 39 months on average to do so. However, this time commitment often paid off. The mean annual wages of students who completed apprenticeships (about $81,000) were nearly 76 percent higher than the mean annual wages among students who enrolled in apprenticeships but did not complete them (about $46,000). While these numbers are promising, the small sample size makes it difficult to draw conclusions from them, and further research is required to determine whether these gains can be attributed to the apprenticeships and whether they remain when the number of apprentices increases.

3. See Samina Sattar, Ryan Ruggiero, and Kirsten Miller, "The Power of Apprenticeships in a Changing Labor Market," (website: https://www.mathematica.org/blogs/the-power-of-apprenticeships-in-a-changing-labor-market, 2025); Amy Roach, Apprenticeships Now: Trends, Investments, and Opportunities Nationally and in Washington (Washington Student Achievement Council, 2025, available at: https://wsac.wa.gov/sites/default/files/Apprenticeships-Now-Trends-Investments-Opportunities-Nationally-and-WA.pdf).

Registered Apprenticeships and Apprentices by Pathway

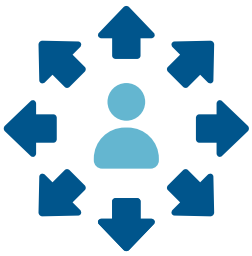


SOURCE: MDRC calculations based on data from the Washington State Education Research and Data Center.

NOTES: Apprenticeships included in this analysis are limited to registered apprenticeships found in the Apprenticeship Registration and Tracking System hosted by the Washington State Apprenticeship and Training Council and administered by the Washington State Department of Labor and Industries. "n<4" indicates that fewer than 4 students fit this category.

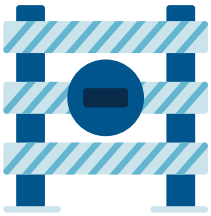
In Summary

At this initial point in the project, the team has already identified several important findings about the range of pathways, credential attainment rates for each, and the associated labor market outcomes. These findings are summarized below. Some of these points will be expanded upon in an upcoming brief.

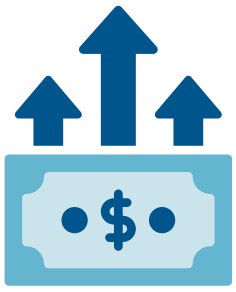


There are a plethora of pathways. Students are taking a variety of pathways through postsecondary education and training and into the workforce. Fewer than one-fifth of students are following the normative pathway that leads from high school directly to a four-year bachelor's degree program and into the workforce. More students are following paths through community and technical colleges or taking journeys through multiple types of institutions.

Around 44 percent earn a credential within six and a half years. Some of the students on pathways 7, 10, 11, and 12 who remained enrolled as of the end of the observation window are also likely to go on to earn their credentials within the next few years, given national completion patterns.[4] It is important to keep in mind that these students encountered the COVID-19 pandemic only two and a half years after their high school graduations.



Nearly one-third of students enroll in college but leave without a credential. Focusing on the group of students on the Some College, No Credential pathway could help Washington State reach its goal of having 70 percent of adults ages 25 to 44 hold credentials, especially as some students on this pathway have been enrolled for multiple terms and are likely to have accumulated several credits. This pathway is the focus of an upcoming brief.



All pathways result in a broad range of earnings. The pathways that include attaining a credential show a wide range between the twenty-fifth and seventy-fifth percentile in earnings, suggesting that the program of study associated with a credential matters a lot. However, even for pathways that do not include credential attainment, there is a wide range in earnings. Many dynamics produce this range, including the fact that to some extent, young people select these pathways themselves, and their selection is likely to be influenced by a variety of characteristics and contextual factors that also influence labor market outcomes.

4. National Student Clearinghouse Research Center (2025).

Technical Notes

DATA

This study uses state longitudinal system data (often called P20W data) provided by the Washington State Education Research and Data Center (ERDC). This longitudinal data set follows individuals from early childhood through K-12 education into postsecondary education enrollment inside and outside Washington state, and into the Washington workforce. The findings in this infographic are based on data from the 2017 cohort of on-time graduates from public high schools in Washington state. This population included nearly 64,000 individuals.

See https://erdc.wa.gov/about-us/about-erdc for more information on the Washington State longitudinal data system.

METHODS

The team combined social sequence analysis and cluster analysis to (1) map trajectories for all members of the cohort and (2) cluster similar trajectories to identify the 12 pathways. The team ran several iterations of the sequence and clustering analyses and identified the version that was most useful to WSAC's policy priorities.

LABOR MARKET OUTCOMES

The team used unemployment insurance wage records data included in the P20W database to create the labor market outcomes described below. Note that the data only include employment in Washington state and exclude certain types of employment such as gig work, some government contracts, some agricultural work, and military service. Also, the data do not allow the research team to differentiate between periods of unemployment and periods when someone is not employed but potentially engaged in other activities (for example, caregiving or military service).

Outcome measures shown in this infographic:

Ever employed indicates that an individual had earnings reported in the unemployment insurance wage data for at least one quarter in 2023.

Stably employed is based on the ERDC definition and indicates that an individual had earnings in all four quarters of 2023 and earned a minimum of $14,000.

Twenty-fifth percentile, median, and seventy-fifth percentile earnings are calculated among individuals who were stably employed in 2023.

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