EXHIBIT E

Putting Career and Technical Education to Work for Students

A PLAYBOOK FOR STATE POLICYMAKERS

NOVEMBER 2017

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ExcelinEd

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About ExcelinEd

Launched by former Florida Governor Jeb Bush in 2008, ExcelinEd supports state leaders in transforming education to unlock opportunity and lifelong success for each and every child.

From policy development to implementation, ExcelinEd brings deep expertise and experience to customize education solutions for each state's unique needs. Focused on educational opportunity, innovation and quality, ExcelinEd's agenda is increasing student learning, advancing equity and readying graduates for college and career in states across the nation.

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FOREWORD

In the summer of 2017, the Department of Labor announced there were 6.2 million job openings. At the same time there were 7 million unemployed Americans.

The numbers tell us that those looking to hire are struggling to find qualified applicants, while those seeking jobs are finding their skills no longer are relevant in today's economy.

This disconnect between the knowledge demanded by employers and the knowledge possessed by workers only will worsen as more jobs require specialized training. This is taking a tremendous toll on individuals and our nation's economy.

States must meet this challenge by creating education systems that align with the needs of their employers.

Too often we define K-12 success in terms of students graduating to pursue four-year college degrees. In fact, there are numerous paths for well-paying careers in everything from manufacturing to health care to information services.

Career and technical education, known as CTE, can be a very effective option when done well.

Students can work on industry certifications and college credits while in high school, allowing them to continue to college with a clear path to a useful degree or additional credentials. They also can participate in internships and on-the-job training, ensuring they are fully prepared for the challenges ahead. All of this is at a substantial cost savings to parents.

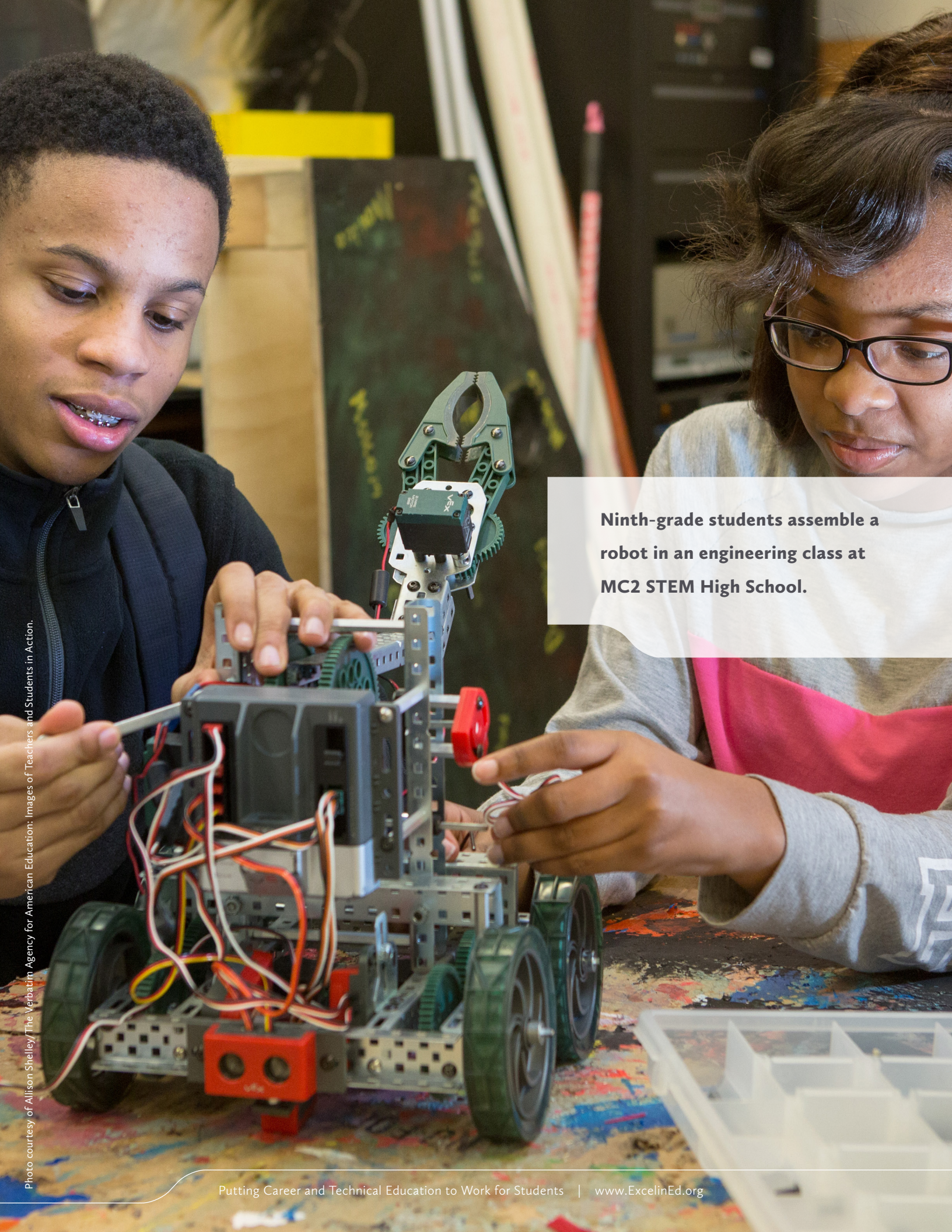
ExcelinEd believes rigorous Career and Technical Education is a critical, but often overlooked, element of education reform.

I encourage you to read this Playbook, learn what constitutes a successful program and see what other states are doing to prepare their students for the workplace of tomorrow.

Please do not hesitate to contact us with questions or assistance in developing or improving your program.

Patricia Levesque

Patricia Levesque
Chief Executive Officer
Foundation for Excellence in Education



Ninth-grade students assemble a robot in an engineering class at MC2 STEM High School.

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

The Case for Career and Technical Education Reform

WHY

INTRODUCTION

Once dubbed Vocational Education, Career and Technical Education (CTE) celebrated its centennial anniversary in 2017. The federal Smith-Hughes National Vocational Education Act signed in 1917 marked the first nationwide investment in career training at the secondary level. That initial investment has continued through the Vocational Education Act, authorized in 1963 (since renamed the Carl D. Perkins Vocational and Technical Education Act) and reauthorized most recently in 2006. Congress is poised to reauthorize the Perkins Act, yet again signaling that the importance of this framework has not dimmed over time.

In 2017, the federal investment in CTE topped $1.4 billion (for secondary and postsecondary). Currently, CTE programs represent the primary provider and funding source for workforce preparation in high schools across the nation. For their part, 40-plus states supplement these federal funds by spending millions each year to support statewide secondary CTE programs operated by school districts and high schools.[2] Some states are seeking ways to provide even more funding to expand learner access to CTE pathways and workforce training.

There is good reason for continued support of and interest in CTE. The most compelling is the widely publicized "skills gap" – the difference between what employers need to fill in-demand positions and the current knowledge and skills possessed by American workforce.

America's Skills Gap What Employers Need and Our Workforce Does Not Fulfill[2]

Manufacturing Workers

2
million jobs currently available

Cybersecurity Professionals

2
million global jobs by 2019

209,000
jobs available now

Registered Nurses

1.2
million vacancies between 2014-2022

Skilled Welders

290+K
jobs currently available

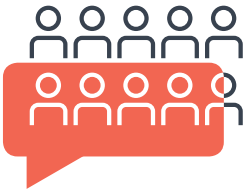
Allied Health Worker

UP TO 2.5
million worker shortage by 2020

Software Engineering

3
openings in software engineering for every 1 computer science college graduate.

Source: See endnotes 4-10



Nearly half (46 percent) of employers report difficulty in filling open positions across a range of career sectors.

Many of these open positions offer middle- and higher-wage salaries, as well as opportunities for continued training and advancement by employers, but they go unfilled due to a lack of appropriately skilled workers who have completed aligned programs of study.

This gap is not expected to close soon. In fact, it only threatens to grow in the years to come as automation and artificial intelligence render more low-level and repetitive-task jobs obsolete. The reality is that more and more Americans will need advanced levels of postsecondary and career training to fill not only present-day jobs, but also the jobs of the future. By 2020, almost two-thirds of the projected jobs will require some postsecondary education: a third of those jobs will require a bachelor's degree or higher, and another third will require an associate's degree or postsecondary certificate.[11] This last segment is the fastest growing credentialing level and speaks to the fact that a high school diploma is no longer the main gateway to long-term economic sustainability for workers.[12]

Unfortunately, too many state CTE programs are NOT fulfilling the promise of improving students' career readiness, expanding their access to postsecondary credentials or providing opportunity for long-term advancement and success in the workforce. Despite the longevity, and importance, of these essential programs, many do not align with regional workforce needs or provide clear pathways to careers. We must work with state programs to address hard questions about their coursework, pathways, experiences and results. This is how we will close the skills gap and build a successful American workforce.

Common Challenges to CTE Program Quality

A high-quality CTE program should reflect the needs of business and industry and should ensure students are well-prepared to meet those needs. While this statement may seem obvious, for many CTE programs it is still aspirational. As with any long-standing education program, change can often come too slowly – and the available teaching staff, coursework, and pathways currently offered may not be aligned to the needs of tomorrow. Consider a few challenges facing state CTE programs that should spur state policymakers to take a close look at their existing programs:

The Broad Scope of CTE Program Offerings

Most state career and technical education programs encompass all business and industry sectors, regardless of specific state and regional needs. Organized under the National Career Cluster Framework, which includes 16 Career Clusters, CTE programs of study can offer a wide range of courses and pathways for students to explore. Considering that each of the 16 clusters contain multiple pathways, there can be hundreds of career pursuits and options across multiple sectors.

While this multitude of options may seem enticing, it can dilute and/or obscure states' real needs and opportunities. Too many CTE pathways can resemble a convoluted buffet of options, rather than a focused set of progressive courses aligned to industry needs and workforce opportunities. In general, only a few states provide strong guidance or data-driven information to educators and students as to which program offerings reflect regional and statewide workforce demand. This scattershot approach to course offerings can prevent students and parents from fully understanding where real market demands lie in their communities, and by extension, which pathways best match both students' interests and employers' needs.

National Career Clusters Framework

Agriculture, Food & Natural Resources	Architecture & Construction	Arts, A/V Technology & Communications	Business Management & Administration
Education & Training	Finance	Government & Public Administration	Health Science
Hospitality & Tourism	Human Services	Information Technology	Law, Public Safety, Corrections & Security
Manufacturing	Marketing	Science, Technology, Engineering & Mathematics	Transportation, Distribution & Logistics

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

The K-12 and Business Sector Divide

Compounding this issue is the fact that the education and business sectors still speak different languages and often value different skills priorities. While perennially advocated for, strong education-business partnerships are not easy to cultivate. Despite some progress, most districts and schools still select their CTE program offerings without meaningful input from local and regional industry representatives or labor data analyses. As a result, too often K-12 administrators end up defining the career preparation their students access and experience based on currently employed teacher expertise and qualifying endorsements and/or student course subject popularity. It is not unusual to see school districts invest thousands of dollars in a program based on these factors, regardless of market demand or projected earnings for students who complete the pathways.

Consider the following examples:

	Floral Design	Cosmetology	Computer Support Specialist
Employment	43,990	352,380	602,840
Mean Annual Wage	$27,610	$29,590	$53,100
Projected Growth	-3%	10%	12%

Source: U.S. Bureau of Labor Statistics Occupational Employment Statistics (May 2016) and Occupational Outlook Handbook

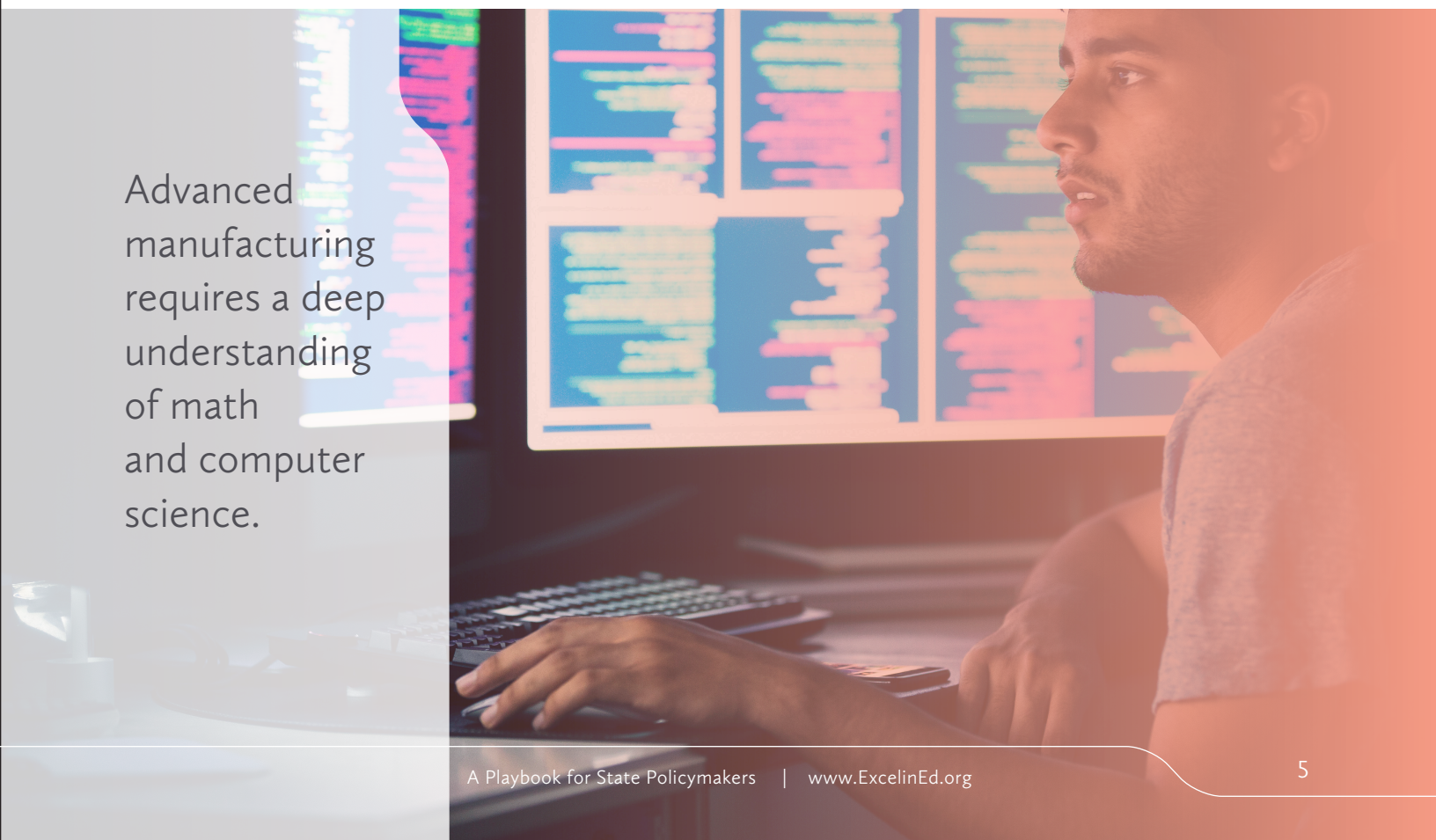
With floral design, the Bureau of Labor Statistics is forecasting a decline (low growth), paired with lower wages. By contrast, cosmetologists are projected high growth, paired with lower wages. Finally, computer support specialists are projected to be in higher demand and earn almost 80 percent higher wages. Of course, this doesn't mean that states should be preparing all students to become computer support specialists. Instead, states should be placing greater emphasis on understanding, developing and supporting course offerings and pathways that will result in better postsecondary outcomes which lead to higher wages and in-demand growth based on regional and state labor data and industry input.

The Legacy of "Vocational Education"

Despite efforts to trumpet various innovative CTE initiatives, too many policymakers, advocates, educators and parents still view CTE as an alternative to rigorous academic study and postsecondary attainment. For many years, CTE was "Vocational Education" and too often a pathway reserved for students who were not deemed "college material," – whether due to their race, economic status or the school community culture. In practice, this meant that students were offered trade-related coursework instead of – and not in concert with – classes, counseling and experiences that could also open doors to postsecondary study and degree attainment. As a result, graduates were consigned to low-level job opportunities without the preparation or skills they needed to advance or adapt as technology and globalization transformed the economy and eliminated many of the positions available to them.

While times have changed and progress has been made, the legacy of vocational education persists. Consider the advising or counseling that students receive in high school. Based on existing certification and training requirements, guidance counselors often lack a deep understanding of CTE pathways or the advanced coursework needed at the secondary and postsecondary levels to ensure long-term success in a CTE pathway. For instance, individuals entering an advanced manufacturing program will need deep understanding of math and computer science to manage computer automated systems. Yet in some cases, districts place students in "alternatives" to math and science courses that are less rigorous than traditional core academic courses. If a student wished to pursue studies leading to a career in advanced manufacturing, that student would be at a severe disadvantage if not advised and placed in appropriate preparatory courses. To this day, adult and system biases too often determine a student's interests and course options, inadvertently either expanding or limiting that student's life options.

Advanced manufacturing requires a deep understanding of math and computer science.

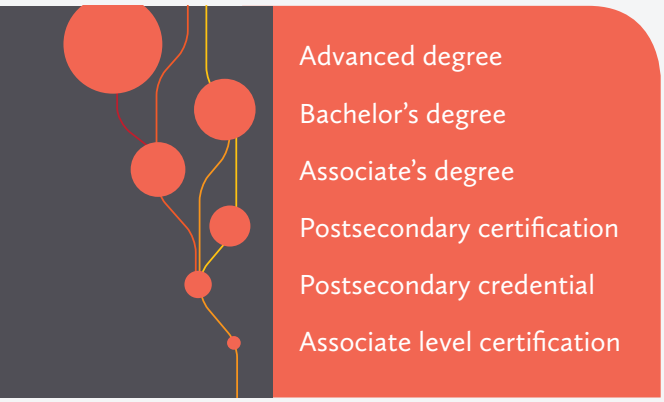


Vertical Linkages

A Hallmark of High-Quality, Aligned CTE Programs

Vertical linkages represent a seamless connection between secondary and postsecondary pathways that can help ensure long-term student success.

Strong vertical linkages between secondary and postsecondary credentials offer students broader opportunities to succeed in a globally competitive workforce. States best help students when they give them the opportunity to earn stackable and transferable credentials as they progress along their chosen pathway. These are a series of ascending credentials that allow a student to progress from an associate level certification at the secondary level to a postsecondary credential – postsecondary certification, associate's degree, or bachelor's degree and beyond – at the student's choosing.



Through these established vertical linkages, students can choose to enter and exit their state's education system as their interests, skills and jobs require. At the same time, they provide meaningful opportunities for earning postsecondary credentials over the course of their lives.

For example, the Florida College System and Florida Department of Education negotiated articulation agreements that recognize industry credentials earned at the secondary level for college credit toward associate level degrees.[13] How does this work in practice? A K-12 student who earns a Cisco Certified Network Associate (CCNA) certification would receive 12 hours of college credit toward an associate's degree in Computer Engineering Technology or Network Services Technology, which is linked to a bachelor's degree in Information Systems Technology or similar bachelor's level computer engineering degrees. This may seem like an obvious solution, but it's one that took years of coordination with the state's more than 1,500 public high schools and 28 state colleges. Now, thousands of students benefit from a stepped and coordinated pathway to real world success.

Of course, the three challenges we have detailed here are not the only ones states face in trying to ensure high-quality CTE programs. Other challenges include, but are not limited to: a lack of qualified instructors in the classroom; inadequate funding for essential equipment to make or maintain necessary program changes; and too few options for students to engage in experiential learning. However, these additional challenges can best be met by first guaranteeing that existing promoted CTE programs are:

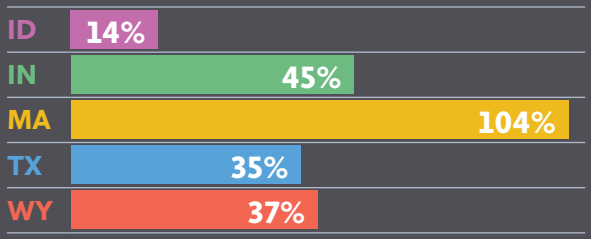
Closely aligned to regional and state labor data and industry demands.
Addressing the alignment of programs will make better use of existing CTE funding by eliminating poorly aligned pathways and strengthening those valued by employers.

Of high-quality in terms of rigorous academic and technical skills preparation.
Increasing the rigor and quality of course offerings and promoted pathways will not only help ensure that students are better prepared for success in future education and career opportunities, but also that states are better prepared to have a workforce well-qualified for the needs of their dynamic economies.

CTE Funding Overview

ExcelinEd looked at a sample of states providing additional funding to districts for CTE courses to illustrate the varying degree to which states are investing in their programs. Data and information was gathered through a review of public documents, including the Perkins Collaborative Resource Network's State Profiles[14] and National Center for Education Statistics Common Core of Data[15], as well as interviews with state officials.

	Standard High School Course Funding Amount	CTE Course Additional Funding Amount
ID	$425-$650	$27-$415
IN	$446	$100-$340
MA	$736	$573-$1,146
TX	$544	$194
WY	$1,075	$393



IDAHO

In Idaho, CTE funding is restricted to the "added cost" of a CTE course. More funding is provided to smaller districts, and each district must provide an initial assurance that the course is based on workforce needs and is in an occupation that is in demand. The state also provides supplemental funding for students in career technical schools.

INDIANA

For each CTE course, Indiana provides a variable supplemental amount based on the wage and demand associated with an occupation. The state also provides performance incentives based a district's number of CTE concentrators, dual credit earners and industry certifications earned.

MASSACHUSETTS

In Massachusetts, additional funding is provided for students enrolled in a CTE program, regardless of how many CTE courses a student takes. To secure initial state approval as a CTE program, districts must show "clear evidence" of labor market demand.

TEXAS

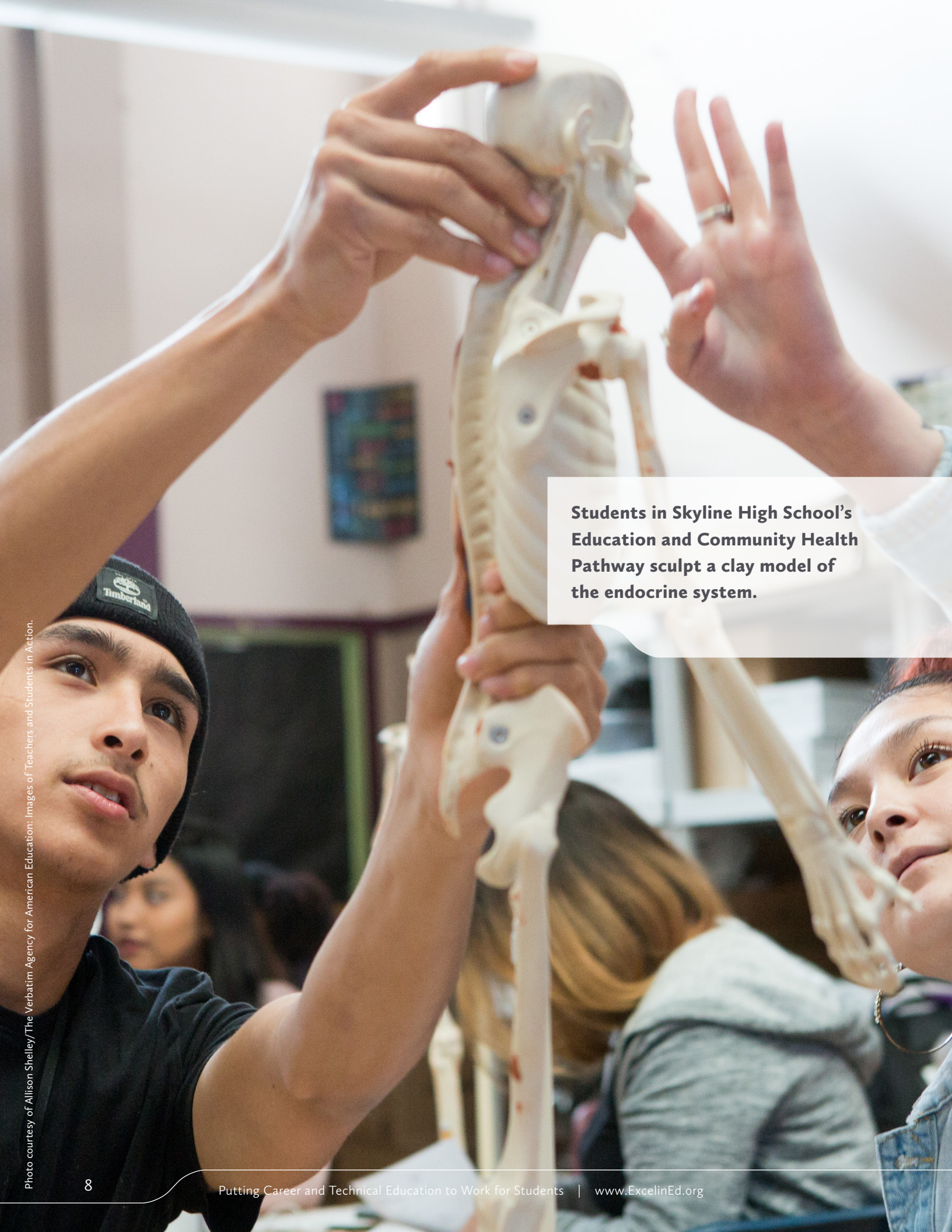
Texas provides additional funding per CTE course and is adjusted for district size, sparsity and cost of living. Districts must offer a coherent sequence of courses in at least three different career clusters. There is no requirement that a specific CTE course be aligned with workforce demand.

WYOMING

To count for supplemental CTE funds, a student in Wyoming must be enrolled in a state-approved course that is part of an approved sequence of three of more CTE courses. Funding is not contingent on a student progressing through the sequence.

Note: The CTE bonus is the percentage above what a district receives for a non-CTE high school course. It includes both state funding and any required local contribution. Where the bonus varies, the percentage is the average. All data is based on Fall 2015 enrollment, the most recent data available for all figures needed.

No matter how much or little states spend on CTE, they need to ensure their programs provide returns on investment in student success.



Students in Skyline High School's Education and Community Health Pathway sculpt a clay model of the endocrine system.

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

Career and Technical Education Reform Phases for States

HOW

While the first part of this report focuses on the "why" of CTE reform, this section seeks to provide policymakers with clear guidance about "how" to accomplish it. What follows are a series of practical, if not easy, measures that states can undertake to improve both the alignment and quality of existing CTE programs. They assume only existing funding, in many cases, and they are borne of real-world efforts taking place in leading states like Tennessee, Delaware and Florida. Major phases of work include:

PHASE I **Engaging Stakeholders and Auditing Existing Programs**

PHASE II **Planning for Systemic Change**

PHASE III **Executing the Plan**

PHASE IV **Remaining Agile Over Time**

The phases and steps below are not intended to be, nor are they reflective of, one-year initiatives. Because they focus both on the outcomes and quality of CTE programs, they require a thoughtful multi-year approach that each state should tailor to its needs and specific goals. Regardless, most state education agencies possess the authority to begin execution now. If done well, some CTE pathways will be eliminated – or at least no longer funded by state and federal CTE dollars. At the same time new, more relevant and high-value pathways may be added, offering parents and students clear pathways to careers in high-demand fields and greater chances at lifetime success.

No Dead Ends

Critical to any discussion about a state's CTE program is the ability of that program to serve as a vertical route for those students who participate and complete their chosen pathways. Does a particular CTE program lead learners to advanced academic learning and technical skills and experiences aligned with occupational opportunities? Or does the program achieve the opposite by graduating students who are under-skilled, under-educated and unprepared for middle- and higher wage employment?

To ensure that there are no dead ends for students, states must look at the entirety of their career and technical education programs when advocating for high-quality, aligned programs.

Few CTE program leaders and educators desire the latter. Yet the question must be posed and seriously examined in light of both American industry's need for middle- and high- skilled workers and the realities that await under-skilled graduates in the workplace. Likely, the answer lies somewhere in between the two extremes. For every highly-touted CTE pathway, there are others that are simply dead ends. These dead ends can be identified by their students who graduate underprepared and have limited employment opportunities, or by communities that are unable to produce the number of skilled and learned workers needed to meet the demands of their current and projected industry needs.

Beyond this simple diagnosis of program value lies a host of other factors that can inadvertently place a well-intentioned learner or community in the same situation. These factors can range from outdated CTE courses and standards to ill-prepared and undertrained CTE educators; from inadequate student advising to limited student access to advanced-level coursework; and from a lack of meaningful, progressive work experiences to misaligned programs of study and unvalued credentials.

Before going any further in this discussion, it's important to address this concept of high-quality, aligned CTE programs. While it is tempting to try to assign a single formal definition of the concept, the reality is that state priorities and programs can, and should, differ based on regional needs and challenges. Instead, we propose certain non-negotiables that can serve as guideposts – or a list of "to dos" – for states as they determine their desired outcomes of high-quality, aligned CTE programs.

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

High-Quality CTE Programs:

Non-Negotiables for State Policymakers

1. **All promoted programs of study align with state and/or regional industry and labor market data.**
2. **Programs of study incorporate experiential learning and capstone experiences valued by industry.**
3. **Secondary programs of study vertically align with postsecondary programs.**
4. **Courses are sequential and progressive in a given program of study.**
5. **Secondary programs of study incorporate courses and exams eligible for postsecondary credit or hours where appropriate.**
6. **Course standards are robust and accurately represent the academic, technical and employability skills learners must master.**
7. **Educators receive ongoing, progressive training and professional development to ensure their instruction is reflective of course standards and current industry work environments.**
8. **Federal, state and local funding are utilized to leverage and drive programmatic changes leading to the implementation of vertically aligned education-to-career learning pathways.**

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

PHASE I

Engaging Stakeholders and Auditing Existing Programs

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

Before making any substantive changes to a state CTE program, key stakeholders must first understand their CTE landscape. This means resisting the frequent urge to provide immediate responses and fixes. By agreeing, first, to understand what is needed and, second, to map their state's CTE landscape, stakeholders will develop a stronger resolve when it comes time to advance and implement a robust state CTE program aligned with economic and workforce opportunities.

Though individuals and titles will vary across states, the agencies and affiliates that constitute a state's key stakeholder group should not. Key stakeholders should include:

- **K-12, notably secondary education**
- **Postsecondary, notably technical colleges and community colleges**
- **Labor and workforce**
- **Business and industry**
- **Economic development**
- **Governor's office and key legislators**

While how a state's key stakeholder group is engaged will vary by state, what is most important is that their voices are captured – particularly those of business and industry. This will affirm that the overall process identified the right recommendations and action steps, and that there will be widespread buy-in and backing when it comes time to making changes, some of which will be unpopular with certain interest groups. Some stakeholders may be engaged throughout the process, while others may be tapped at certain stages to provide critical feedback. At the end of the day, who falls in the category of "key stakeholder," rests with the agency leading the effort. Of course, states should select the right person to lead the overall effort – a leader with credibility, focus, and willingness to go where the data lead.

Key Actions

Before launching into the process, states should take three key actions. These actions will help frame the work at hand and provide a clear view of a state's current CTE landscape. From these actions, a state can confidently craft and implement an appropriate strategic plan that aligns its CTE program with its economic opportunities and workforce needs.

Action 1: Determine Process

Determine the overall project approach and process. Who from the lead agency will oversee the project? Who will be included in the key stakeholder group and how will members of the group be involved throughout the process? Which staff members from the lead agency will support the work of the project lead? What are potential appropriate timelines for the distinct phases of the initiative – from framing, to implementation, to ongoing program evaluation?

Action 2: Identify Goals

Once the overall process has been determined, including who will oversee the effort, states should begin framing with key stakeholders what is desired. What should a high-quality, aligned state CTE program achieve? Who would/should benefit and how? Ideally, what should a robust state CTE program ultimately accomplish? At this point, conversations can remain conceptual, but they should be informed by regional and statewide labor market data and information.

Action 3: Audit Existing Programs

Getting to what is desired for a state CTE program requires key stakeholders to understand first where their state CTE program is currently. Is their state CTE program aligned to the state's workforce needs and middle- and higher-wage job opportunities? To answer that, leaders should complete a thorough program audit. An audit, if conducted correctly, should serve as an asset map for the state – revealing where components of the current state CTE program are aligned and where they are misaligned based on what the state wants it to achieve – that is reflective of its labor, economic and education data and priorities.

A robust data and information gathering process should drive any mapping of a state's current CTE landscape. This process should be methodical and should incorporate not only quantitative data collected from various state agency data systems, but also qualitative data in the form of surveys, interviews and focus groups involving various state, regional and local stakeholders, including students and educators (faculty and administrators).

Core Components to Audit and Key Questions to Address

At a minimum, an audit should examine the following core components (utilizing the key questions) of a state CTE program. Recognizing that there are several layers and sublayers that fall under these components, a state should take a critical approach to identifying what should be examined under the audit. Leaving out an essential component could inadvertently skew an eventual recommendation.

1. Academic Offerings: Programs of study and courses

- Are promoted programs of study and their complementary courses fully aligned with state/regional labor and workforce data and economic projections?
- Are the courses for each program of study sequential and progressive?
- Do programs of study have some type of identified capstone experience for students?
- Are course standards and curricula academically robust and reflective of industry input?
- Are the programs of study vertically aligned with postsecondary program offerings?
- Are there multiple ways for students to earn postsecondary credit or hours transferable to aligned postsecondary programs?

2. Program Funding: Federal (formula and incentive), state and local

- Is the state utilizing the Carl Perkins Reserve fund to drive state CTE program priorities?
- Are the state's quality indicators (as part of Perkins accountability) reflective of state funding and program priorities?
- Are local education agency plans reflective of state priorities and state/regional labor and workforce data and economic projections?
- What levels of state and local funding have been made for equipment purchases for the high growth, high-skilled career pathways?
- Are funding levels keeping pace with program and curricula needs for robust, hands-on learning reflective of industry expectations?
- Is teacher hiring keeping pace with targeted high growth, high-skilled career pathways?

3. Student Achievement: Outcomes of CTE courses and pathways

- Data, including accountability and transparency indicators
  - What data are currently being collected on the state CTE program? Is it minimal or robust? How much of what is collected is independently verified and how much is not?
  - Can "postsecondary and career readiness" be affirmed using the data currently collected; what criteria are in place to affirm?
  - Where are there holes in the available data collected on student achievement and the larger student lifecycle, in terms of secondary, postsecondary and employment attainments?
  - To what degree does the state's longitudinal data system accurately reflect the education and workforce landscape based on the data currently collected? What data are missing and from what state agency?

- Out-of-classroom experiences:
  - What types of out-of-classroom experiences are promoted by state policy and programming?
  - Do all secondary students have access to these offerings if desired? If not, why not?
  - What is the quality of these experiences?
  - Are these experiences aligned with state promoted programs of study and courses? A student's personalized learning plan? How are these confirmed?
  - What evaluative measures are in place to affirm quality and alignment?
  - What types of trainings and/or guidance are provided to educators and to participating external stakeholders?
- Credential attainment:
  - What types of credentials are available to secondary students prior to graduation?
  - Do the promoted credentials carry value at the postsecondary level and in the workforce; what evaluative processes are used to affirm value?
  - Is the portfolio of promoted credentials robust and reflective of the industry needs or is it limiting and not fully reflective?
  - Are all students, who are qualified, provided access to sit/acquire these credentials? How is that confirmed?
  - What are the eligible, participation and pass rates for qualified students?
  - What marketing and incentives are used to increase student participation?
- Matriculations and transition:
  - How many high school graduates (cohort and by subgroup) matriculate to a postsecondary institution, by all students and by students who concentrate in CTE?
  - For concentrators, how many enroll in postsecondary programs aligned with their secondary programs of study?
  - How many concentrators begin their postsecondary programs with PLA credit?
  - How many concentrators complete their postsecondary program and graduate with a credential?
  - How many concentrators enter the workforce in occupations aligned with their programs of study?

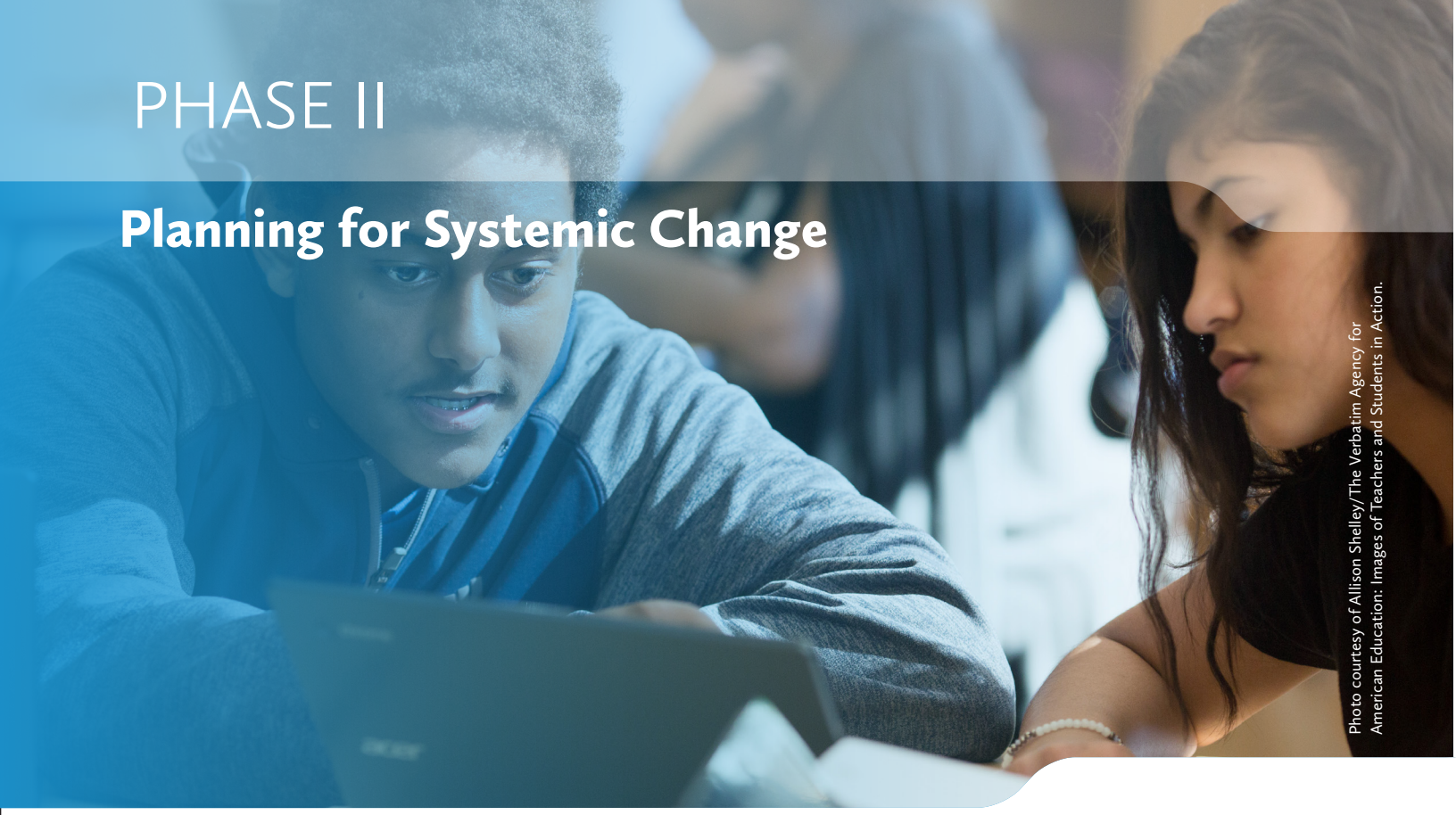
4. **Educator Professional Development and Training: Teacher and administrator**
   - What types of formalized PD and training are made available to educators by the state?
   - Are the offerings aligned to the priorities of the state?
   - Do the offerings incorporate input from state and regional business and industry where appropriate?
   - Can all educators access the state's offerings? What percentage do not access the offerings and why?
   - What type of guidance does the state give to ensure quality PD and training is being provided to educators at the local level (and which aligns the priorities of the state)?
   - What evaluative process is used to determine program quality and alignment?
5. **Stakeholder Engagement: Industry, postsecondary, educator, student/parent**
   - What stakeholders are engaged in the promotion and maintenance of the state's current CTE program? What does that engagement look like for each stakeholder group?
   - How is stakeholder engagement used to evaluate the quality and content of the state CTE program?
   - Is there diversity of perspective that is regularly being refreshed by the recruitment of new stakeholders?
   - Are their participations be maximized and leveraged accordingly or are some groups underutilized?
   - What is the level of engagement between state agency stakeholders? Is the engagement producing meaningful shared policies, programs and/or funding opportunities?

During this data and information gathering process, it is not uncommon to discover that some desired data cannot be found, or that the quality of data collected is subpar – meaning the data are outdated, self-reported (with no reliable validating mechanisms), measuring the wrong indicators, or only telling half the story. Though unfortunate, this all too common discovery by states can, and should, set the stage for the eventual development of a robust quantitative and qualitative data collection system as part of a state's ongoing CTE program evaluative process.

In general, a state CTE program audit should take no more than three to five months. The process should include regular progress reports, which are intended to identify and remove any data collection barriers and affirm timely completion of the audit. Based on the analyzed findings, a state should then compare its existing programs to the "non-negotiables" and its goals for the program going forward. By identifying and affirming the state's priorities and existing gaps in meeting these, there will be no gray areas or misunderstandings by key stakeholders when the planning and implementation phases are launched.

PHASE II

Planning for Systemic Change



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Using the information gathered through the program audit, the development of a comprehensive strategic plan comes next and should fully reflect the initiative's overall agreed-to goals, objectives, and expected outcomes, as well the identified non-negotiables of a high-quality, aligned state CTE program. This task is best assigned to the project lead, who can rely on other staff members and key stakeholders where appropriate for critical feedback, assistance and affirmation.

Creating a strategic plan is hardly unfamiliar territory for any state. Instead of articulating its components or the process, what follows is a list of key issues that should be addressed related to CTE program reform.

Timelines and Rollout of Activities

One of the most important considerations when developing a strategic plan is determining and prioritizing timelines and rollouts. What needs to begin immediately? What can come later? What could be labor-intensive, requiring a significant amount of time (e.g., program and curricular revisions) or require possible resources, such as additional personnel or funding? What could have multiple rollout dates as part of a comprehensive phase-in (e.g. new or revised programs of study and/or courses over several academic years)? Conversely, what may be retired or phased out and will that require multiple dates?

When determining rollout and implementation timelines, states must consider academic calendars and any actions and items that may require state board or legislative approval. How does the strategic plan account for these set calendars and schedules? How much earlier must specific action items be completed to be reviewed and/or approved for timely rollouts? Are there any actions that include cross-agency agreements – such as data sharing agreements or memorandums of agreement – that may require time to approve? In all situations, the strategic plan and its identified timelines and rollouts must be sensitive to the stakeholders most impacted by the changes to best ensure the full implementation of the plan is successful.

Budget and Costs

A revitalized state CTE program does not necessarily equate to new or additional costs. However, there may be costs related to several agreed-to action items during the process, such as a need to bring in external expertise to assist the state with CTE course standards revisions. Determining if these costs can be covered through an existing operating budget, or if they must be requested for an upcoming fiscal year budget, will also influence rollout and implementation timelines. When looking at budgetary expenses during the planning phase or implementation phase, it is also important to identify if the new or additional expenses will be one-time or ongoing. For example, if part of a state's revitalized CTE program is to expand early postsecondary credit attainment for students, while eliminating the barrier of exam fees, there will be an ongoing budgetary expense to achieve this.

Communications

Communications and messaging are often the most underplayed and overlooked component of any strategic plan. And if not incorporated on the front end, they can trip up the most well thought out plan. A state's strategic plan must have a section specific to overall communications and messaging, as well as communications elements incorporated within specific initiatives throughout the plan. For example, a state's strategic plan should include a messaging strategy for addressing changes in course and certification offerings and use "road shows" that state staff will take to share these key messages with local educators and communities. Educator professional development and training tied to new course standards can only be successful if the rationale, availability, dates and agendas are communicated to educators clearly and regularly.

Staffing Expertise

Finally, a state must consider, and plan for, how an approved strategic plan will impact their own staff members. What are the levels of content knowledge and ability – or bandwidth – of those who will be charged with executing aspects of the plan? Are their skills sets where they need to be for success? Successful changes will only be as good as the individuals charged with overseeing the implementation of it. Planning for internal content development training or different staffing needs based on assigned strategies is essential and should be factored into the overall strategic plan.

PHASE III

Executing the Plan

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

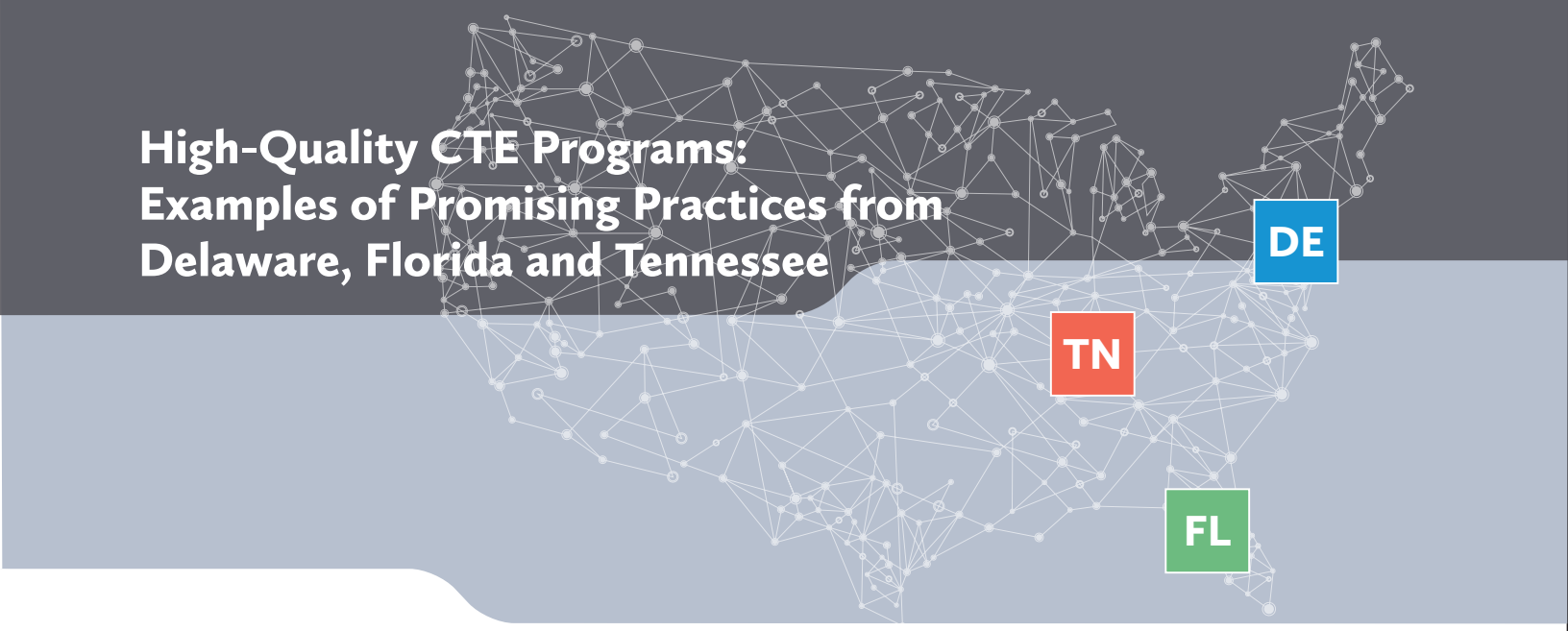
Once a comprehensive strategic plan is developed, the strong execution of that plan is essential. One of the most critical and overlooked steps to ensuring strong execution is keeping all stakeholders firmly engaged in the process, particularly when the realities of what has been proposed in the plan begin to take shape on the ground. When these changes span over multiple calendar and fiscal years, the need for key stakeholders to remain resolute and committed takes on even greater importance.

Part of this begins with the public acknowledgment that there will be ongoing disruptions to the existing state CTE program as the strategic plan is being implemented. These disruptions may include the ramping up of new or revised programs of study and courses with more robust standards and ramping down and retiring of programs of study and courses that no longer reflect state priorities. Additional disruptions may include the overhauling of other statewide programs that are core to a state CTE program (e.g., experiential learning or career technical student organizations).

Recognizing that change by its very nature brings heightened concerns and anxieties, particularly for those most impacted, the importance of having ongoing transparent communications and dialogue with all effected stakeholders and populations, particularly educators and students, cannot be stressed enough. After all, many schools and districts may see pathways – in which they have invested time, staffing, and money – eliminated. This is not an easy pill to swallow. Communicating what will change, how it will be carried out and when it will take place is critical to mitigating the inevitable stresses of the process.

As the strategic plan is being implemented, there should be regular intervals that allow for interim progress reports and a revisiting of the plan's central tenets, strategies and action steps to allow for any adjustments or changes as necessary.

High-Quality CTE Programs: Examples of Promising Practices from Delaware, Florida and Tennessee



No state has implemented all the "non-negotiables" of high quality CTE programs, but **Delaware**, **Florida**, and **Tennessee** have taken bold steps to address both the alignment and quality of their state programs. Below are highlights of the efforts these three states have undertaken to ensure that their CTE programs are preparing students for postsecondary study and career readiness in high-demand business and industry sectors.

1

All promoted programs of study align with state and/or regional industry and labor market data. [TN]

The **Tennessee** Department of Education's (TNDOE) Office of CTE performs an annual review of its programs of study and courses using labor and economic development data. The TNDOE also conducts a review postsecondary program and certificate offerings from technical colleges, community colleges, and four-year universities to determine which programs of study should be promoted. Based on these reviews, the Office of CTE makes changes to programs of study and the corresponding courses to continue the vertical alignment between secondary education, postsecondary, and the statewide labor market.

2

Programs of study incorporate experiential learning and capstone experiences valued by industry. [DE]

In **Delaware,** all CTE programs of study include early postsecondary coursework, work-based learning experiences, and industry certification where available and appropriate. Approved CTE programs of study provide all students with the opportunity to participate in early career opportunities and earn postsecondary credit while still in high school.

3

Secondary programs of study align vertically with postsecondary programs. [FL]

Florida reviews programs of study developed in each of the state's 17 Career Clusters. These programs are submitted as part of the grant application process, and each local program of study must include a written articulation agreement that establishes and validates the career pathway. All articulation agreements must be signed and approved by the agency head of each participating secondary and postsecondary institution.

4 Courses are sequential and progressive in a given program of study. [TN]

In **Tennessee,** CTE courses are placed into sequenced programs of study. These course sequences are structured to build on the knowledge and skills obtained from one course to the next. Various programs of study have industry certifications, work-based learning experiences, and early postsecondary opportunities built into the course sequencing to ensure students are prepared to seamlessly transition into aligned postsecondary and career opportunities. CTE course standards and course sequences are reviewed annually during the program of study justification process.

5 Secondary programs of study incorporate courses and exams eligible for postsecondary credit or hours where appropriate. [FL]

Gold Standard Career Pathways Articulation Agreements are maintained by the **Florida** Department of Education as a means for students to receive college credit for successfully earning a nationally recognized industry certification* that is aligned with an associate in applied science or associate in science degree.

6 Course standards are robust and accurately represent the academic, technical and employability skills learners must master. [TN]

In **Tennessee**, course standards are reviewed (and revised, where appropriate) during the annual program of study justification process. TNDOE staff ensure that the course standards reflect a high level of rigor and integrate both academic and technical skills. Draft course standards are reviewed by postsecondary and industry stakeholders in the aligned field and released for public comment prior to final approval by the state board of education.

7 Educators receive ongoing, progressive training and professional development to ensure their instruction is reflective of course standards and current industry work environments. [DE]

In **Delaware**, professional learning opportunities for teachers are available for all state-model CTE programs of study and reflect course and program level instructional strategies and techniques. Support for school administrators is available through the CTE Cadre, which meets quarterly during the school year to collaboratively develop public policy and support.

8 Federal, state and local funding are utilized to leverage and drive programmatic changes leading to the implementation of vertically aligned education-to-career learning pathways. [A Work In Progress]

Aligning available federal, state, and local funding to support progressive, sequential, and vertically articulated pathways is perhaps the most challenging step in reforming existing CTE programs. Doing so requires cross-agency collaboration to ensure that federal Carl D. Perkins Act, Workforce Investment and Opportunities Act, and Every Student Succeeds Act funds are braided seamlessly to support the state's goals for CTE programs. Local spending on CTE is more difficult to track and requires greater fiscal transparency than available in many states.

PHASE IV

Remaining Agile Over Time

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

Once the strategic plan has been actualized and a new state CTE program is in place, the same responsive approach used during the plan's rollout and implementation should be what now drives how the state continues the promotion of its new CTE program. Core elements to an ongoing, responsive program include:

- **Instituted evaluative processes to review the overall state CTE plan to ensure continued relevance and efficiencies.**
- **Annual review of programs of study and related courses to ensure postsecondary and workforce alignment.**
- **Highly-skilled staff who are content experts.**
- **Ongoing, timely communications and messaging tools being delivered to stakeholders.**
- **Robust department and state data systems reflective of high-quality data fields and collection methods.**
- **Highly engaged industry advisories and faculty advisories across the program delivery and program evaluation continuums.**
- **Regular cross-agency convenings to drive shared interests, policies, programs and funding.**
- **Ongoing educator training and professional development "lifecycle" models reflective of state CTE priorities.**
- **Identified opportunities to regularly leverage and braid federal, state and local funding to maximize (re)investment in the state's CTE program and priorities.**

Central to the success of any substantive state CTE program is confirming that it is achieving its purpose and that it is remaining relevant to the needs and priorities of the state. Are the changes achieving the desired results? Are a student's education and experiences robust, meaningful and aligned with what industry identifies as essential for hiring and advancement? Are educators utilizing course standards and programs of study in the manner intended? Does the state see a positive trend not only in its student achievement scores and attainment rates but also in its economic and labor growth? These cannot be answered with a one-and-done program evaluation. An ongoing evaluation process must be embedded into the overall operations of the state CTE program.

To answer these broader questions, and institute a meaningful evaluative approach, a state must first identify and answer these process questions:

1. **What should be evaluated and why?**
2. **Which methodological approaches are best suited?**
3. **Which stakeholders should play key roles and in what form?**
4. **How often should various program elements be evaluated?**
5. **What data and information are needed and how will the data be collected?**
6. **What costs may arise when implementing various evaluation methodologies and how often?**

Recognizing that there is a myriad of evaluative approaches that can be employed, a state should seek out the right approach for each identified component. As with the identification and development of a state CTE plan that reflects the priorities of the state, the same approach should be used when it comes to evaluating the state plan. Ultimately, all approaches used must be intentional and must determine if the state CTE program reflects the state's larger vision.

In the end, a high-quality state CTE program is one that remains agile in an everchanging, dynamic environment.

A student looks for a chemical reaction in a beaker during an experiment.

Photo courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.

WHAT'S NEXT

This report is just the starting point of what ExcelinEd hopes will become a deeper conversation and set of processes that states can engage in to improve their CTE programs. There will and should be more specific questions about the outlined steps to align and improve the quality of CTE. To address some of these questions in greater detail, ExcelinEd will publish a series of resources over the next year that explore the steps to CTE program reform in greater depth. From CTE program audits to course evaluation, and from postsecondary program alignment to braided funding strategies, this series will provide states with additional tools and guidance to help ensure their CTE programs prepare students for career success and reflect the needs of their state and regional economies. ExcelinEd looks forward to working with states as they navigate this vital process to improve their CTE programs and provide students opportunities for lifelong advancement and success.

Endnotes

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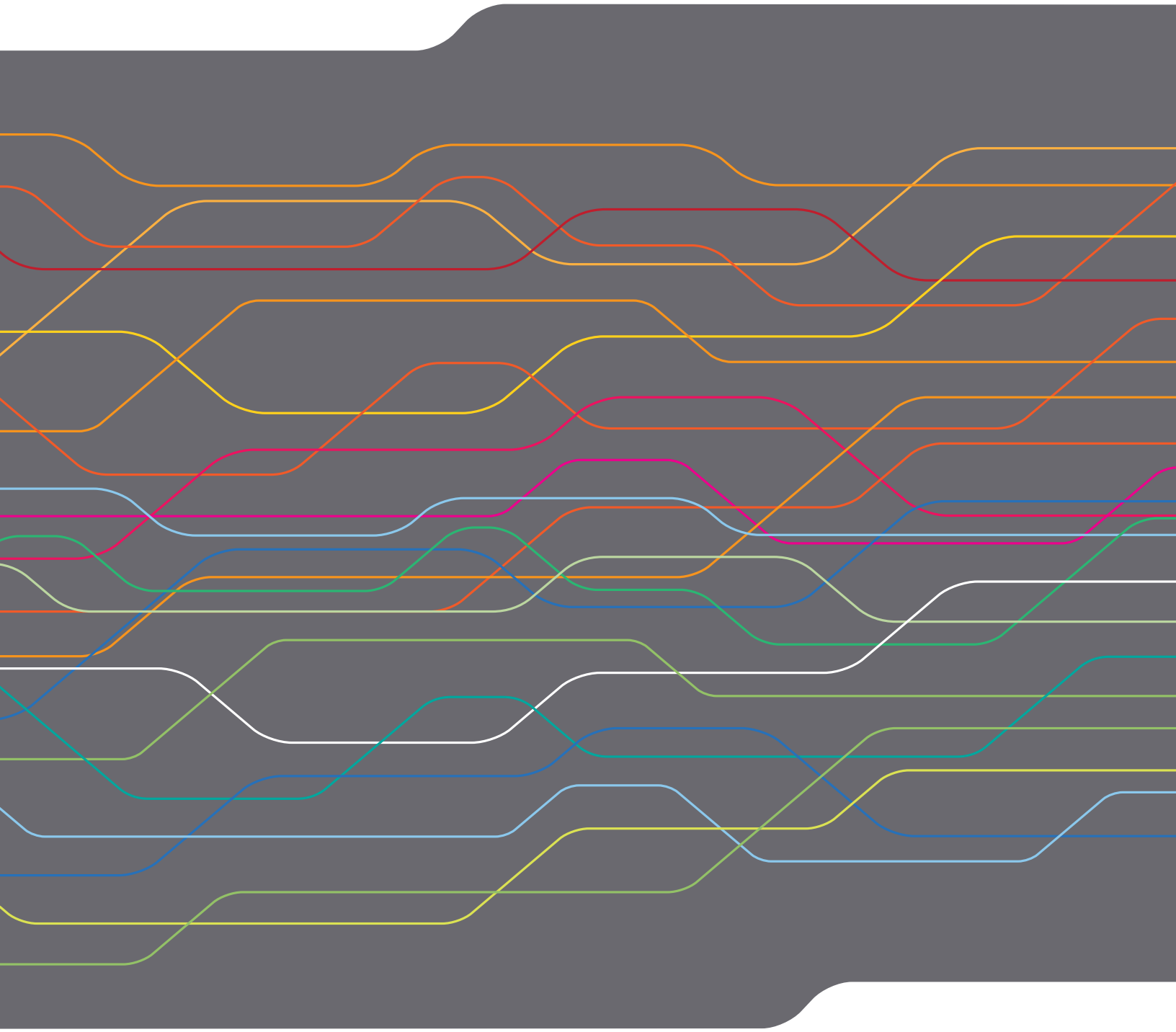

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