

MISSISSIPPI

Career and Technical Education
Needs Better, More Transparent Data

August 2020

SHAD WHITE
State Auditor

Jessica D. McKenzie
Director, *Performance Audit Division*



Executive Summary

Schools received \$43.2 million in taxpayer dollars during school year 2018-2019 for the Career and Technical Education program, yet outcomes cannot be determined due to incomplete data

Key Conclusions

The Mississippi Department of Education (MDE) and the Statewide Longitudinal Data System (SLDS) do not accurately measure the impact the Career and Technical Education (CTE) program has on students. Auditors found that:

1. the intended outcomes of the program cannot be accurately measured;
2. the program is not being tracked and monitored appropriately;
3. the requirements in state law are not being met; and
4. the data utilized by MDE and Lifetracks to measure program success are conflicting.

To reach these findings, auditors conducted interviews, analyzed student transcripts, reviewed reporting practices, researched leading practices, and reviewed other states' statutes.

Recommendations Summary

The report includes five (5) recommendations to MDE; four (4) recommendations to Mississippi State University's (MSU) National Strategic Planning and Research Center's (nSPARC) Mississippi Lifetracks program; one (1) recommendation for the Legislature's consideration; and one (1) recommendation for the Office of the State Auditor (OSA) to complete a performance audit of MSU's nSPARC program. Note: MDE agreed with 4 of the 5 recommendations outlined for them.

Recommendations include:

- revising the MSIS placement report to only include all CTE completers upon graduation to ensure accurate program assessment;
- developing internal controls to ensure the Consolidated Annual Report is free of errors;
- developing a coordinated effort to ensure data quality and reliability;
- citing data limitations for public transparency;
- developing an annual internal audit of the CTE program;
- developing a standard reporting mechanism for the CTE program; and
- following Lifetracks' governing board guidelines.

Overview

Background

The government provides funding for over sixteen (16) individual career cluster curricula that are offered for Career and Technical Education (CTE) across the state. State funds constitute \$43.2 million, while \$6.6 million is provided by the federal government for a total of \$49.8 million. These programs are designed to prepare students for post-secondary education, or provide alternatives to entrance into a four-year university or college after high school graduation. According to the Mississippi Department of Education (MDE) Office of Career and Technical Education, there are more than 500 schools and 15 community and junior colleges offering CTE instruction in 49 distinct occupational areas.¹

According to the United States Department of Education (USDE),² students who focused on CTE courses while in high school had higher median annual earnings eight (8) years after their expected graduation date than those students who obtained a high school diploma without focusing on CTE. The USDE also reports that nationwide, 94% of high school CTE concentrators graduated by the expected graduation year compared to 85% of high school non-CTE concentrators. In Mississippi, the average graduation rate from 2015-2018 for CTE concentrators was 94%, while the rate for non-CTE concentrators was 83% (based on information provided to auditors by MDE).

The federal funds reviewed were those provided by the *Carl D. Perkins Career and Technical Education Improvement Act* of 2006, known as the *Perkins IV Act*. It amended the *Carl D. Perkins Vocational and Technical Education Act* of 1998. The *Perkins IV Act* (P.L. 109-270)³ was signed into law on August 12, 2006. The *Act* was authorized through FY2012, which ended on September 30, 2012.

The authorization was extended through FY2013 under the *General Education Provisions Act*, although the *Act* continues to receive appropriations through 2016 and further. The purpose of the *Perkins IV Act* is to more fully develop the academic, career, and technical skills of secondary education students and postsecondary education students who elect to enroll in career and technical education programs.

As outlined by the Perkins Collaborative Resource Network,⁴ there are six (6) required core indicators of performance in secondary education:

- academic attainment in reading/language arts/mathematics;
- technical skill attainment;
- secondary school completion;
- student graduation rate;
- secondary placement; and
- nontraditional participation/nontraditional completion.

States are required to report annually on these core indicators with disaggregated data on the performance of students by race, ethnicity, gender, and special population categories.

The Mississippi State University (MSU) Research and Curriculum Unit (RCU)⁵ was established in 1965 to serve as the research coordinating unit for vocational-technical education. MSU RCU exists to benefit K-12 and higher education by developing curricula and assessments, providing training and learning opportunities for educators, researching and evaluating programs, supporting and promoting career and technical education, and leading education innovations. MSU RCU administers testing for CTE students. The career cluster pathways and the program area/curriculum for each are listed in Exhibit 1 on the following page.

¹ MDE Office of Career and Technical Education <https://www.mdek12.org/CTE>

² United States Department of Education-*Bridging the Skills Gap: Career and Technical Education in High School* <https://www2.ed.gov/datastory/cte/index.html#WHOGRAUATESFINDSAJOB>

³ Carl D. Perkins Career and Technical Act of 2006 (Perkins IV Act) https://s3.amazonaws.com/PCRN/uploads/perkins_iv.pdf

⁴ Perkins Collaborative Resource Network <https://cte.ed.gov/accountability/core-indicators>

⁵ MSU Research and Curriculum Units <https://www.rcu.msstate.edu/>

**Exhibit 1
Career Pathways**

Cluster Title	Program Area/Curriculum
Agriculture, Food, and Natural Resources	<ul style="list-style-type: none"> • Agriculture and Environmental Science and Technology (AEST) • Agricultural and Natural Resources (ANR) • Agriculture Power and Machinery • Aquaculture • Food Products (Meats) • Forestry • Horticulture
Architecture and Construction	<ul style="list-style-type: none"> • Architecture and Drafting • Carpentry • Electrical • Heating, Ventilation and Air Conditioning (HVAC)
Arts, Audio-Video Technology, and Communications	<ul style="list-style-type: none"> • Digital Media Technology • Simulation and Animation Design • Television Broadcasting and Production
Business Management and Administration	<ul style="list-style-type: none"> • Management
Education and Training	<ul style="list-style-type: none"> • Teacher Academy
Finance	<ul style="list-style-type: none"> • Finance and Accounting
Health Science	<ul style="list-style-type: none"> • Healthcare and Clinical Services • Sports Medicine
Hospitality and Tourism	<ul style="list-style-type: none"> • Culinary Arts • Lodging, Hospitality, and Tourism
Human Services	<ul style="list-style-type: none"> • Cosmetology • Early Childhood Education
Information Technology	<ul style="list-style-type: none"> • Information Technology
Law, Public Safety, Corrections, and Security	<ul style="list-style-type: none"> • Law and Public Safety
Manufacturing	<ul style="list-style-type: none"> • Furniture Design and Manufacturing • Industrial Maintenance • Instrumentation Technology • Metal Fabrication • Precision Machining • Welding
Marketing	<ul style="list-style-type: none"> • Marketing
Science, Technology, Engineering, and Mathematics	<ul style="list-style-type: none"> • Engineering • Polymer Science
Transportation, Distribution, and Logistics	<ul style="list-style-type: none"> • Automotive Service Technician • Collision Repair Technician • Diesel Service Technician • Heavy Equipment Operation • Transportation Logistics

Source: Prepared by auditors using information obtained from the MSU Research and Curriculum Unit

Note: All career cluster pathways are available for school districts to teach except Government and Public Administration, because the Mississippi State University Research and Curriculum Unit does not have the curriculum available.

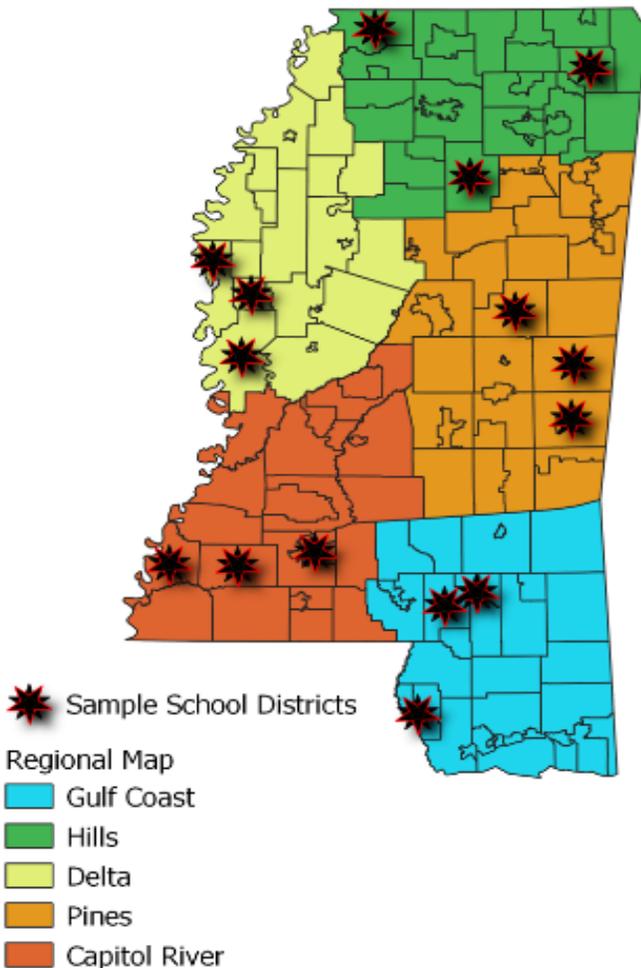
In this review, auditors attempted to answer the following questions:

1. Are the programs meeting the intended outcomes?
2. Are the programs being tracked and monitored appropriately?
3. Are the requirements outlined in state law being met?
4. Are the data submitted by MDE to Mississippi Lifetracks (SLDS) accurate when compared to the sample population?

School districts were sampled by dividing the state into five (5) regions: Delta, Hills, Pines, Capitol River, and Gulf Coast. Three (3) school districts were randomly chosen from each region, totaling fifteen (15) school districts. During the review, each school district received an on-site visit. Transcripts of students who were seniors and pathway completers were analyzed

for the school years 2014-2015, 2015-2016, 2016-2017, and 2017-2018. Each CTE director was interviewed, and all student transcripts were inspected to verify that graduation requirements were met. The students' GPA and career pathway were also noted. A map of the state indicating the sample school district locations within the five (5) regions is displayed in Exhibit 2 below.

**Exhibit 2
Regional Map with Sample School Districts**



Gulf Coast:

- Picayune School District
- Lamar County School District
- Hattiesburg School District

Hills:

- Calhoun County School District
- Prentiss County School District
- DeSoto County School District

Delta:

- South Delta School District
- Hollandale School District
- Greenville Public School District

Pines:

- Kemper County School District
- Louisville Municipal School District
- Lauderdale County School District

Capitol River:

- Franklin County School District
- Brookhaven School District
- Natchez-Adams School District

Source: Prepared by auditors using data obtained from the Mississippi Automated Resource Information System (MARIS)

Program Impact Cannot Be Determined

Agencies are not fully capturing information on student job placement or salaries after graduation

Criteria:

The Mississippi Department of Education (MDE) established rules governing career technical education programs. Rule 83.2(1)(a) of MDE's administrative code states, "Skill programs at the secondary level shall be limited to 9th, 10th, 11th, and 12th grade students." The Mississippi Student Information System (MSIS) generates a placement report that contains the names of students completing a pathway. Schools are required to collect and enter information about the completers' job or educational status into MSIS one (1) year after completion of a pathway.

In 1994, the Legislature passed the *Mississippi Performance Budget and Strategic Planning Act*. The Act was created to improve the state's incremental, line-item, budgeting process by collecting and analyzing data measuring the performance of state agency programs, and the use of this information to deliver public resources to those programs and activities proven to work most efficiently and effectively in achieving targeted results. According to *Building a Better Mississippi: A Statewide Strategic Plan for Performance and Budgetary Success* (2014), the document is meant to hold state government accountable for maximizing the results that it achieves with taxpayer dollars.

The statewide goal is to make available a quality K-12 public education for all Mississippians, upon high school graduation, to either enter the work force with an employable skill or to successfully complete a higher education program. The benchmarks for Career and Technical Education are as follows:

- percentage of high school students enrolled in a career and technical education program;

- percentage of high school students enrolled in career and technical programs who earn an approved industry certification, by career pathway;
- percentage of students earning an approved industry certification who obtain a job in Mississippi in their area of certification; and
- average starting salary of students earning an approved industry certification who obtain a job in Mississippi in their area of certification.⁶

These benchmarks are published by the *Statewide Longitudinal Data System* (SLDS), as established by Miss. Code Ann. §37-154-1. The SLDS manages a publicly published system entitled, Mississippi Lifetracks. Data collected from MDE's Mississippi Student Information System (MSIS) is entered into Lifetracks for compilation and publication. Lifetracks was designed to help meet data needs for reporting requirements and to answer critical policy questions relevant to education, workforce, and economic development. Although Lifetracks collects data from MDE, the two entities are not related. MDE states that it is not responsible for the methodology that Lifetracks establishes for data collection, analysis, and reporting.

Lifetracks also asserts that it is an interoperable data system that securely and efficiently facilitates research and analysis that will enhance the state's ability to link, match, and share education and workforce data leading to an enriched ability within the state to improve career-readiness outcomes and enhance success in the economy.⁷ The Lifetracks system was developed and is maintained by the National Strategic Planning and Research Center (nSPARC) at Mississippi State University.

⁶ Building a Better Mississippi
https://www.peer.ms.gov/Documents/strategic_plan.pdf

⁷ Lifetracks SLDS <https://lifetracks.ms.gov/>

In addition to the CTE benchmarks published by Lifetracks, MDE publishes the Consolidated Annual Report (CAR), which is submitted by states to the federal government annually. It is a cross-sectional survey that reports annual enrollment, financial, and

performance data on their progress in achieving state levels of performance on the core indicators of the *Perkins IV Act*, the federal funding source for career and technical education programs.

Condition, Cause, and Effect:

The Mississippi Department of Education is not accurately tracking student career pathway employment after graduation. As noted, MDE’s policies and procedures manual chapter 83, rule 83.2 (1)(a) states “Skill programs at the secondary level shall be limited to 9th, 10th, 11th, and 12th grade students.” Since students are enrolling in pathways as early as ninth (9th) grade, and completing their training prior to entering the twelfth (12th) grade, the current system of tracking job placement after graduation is not adequate.

Students who enroll in a pathway early skew the outcome data. The MSIS placement report is designed to track students for one (1) year after completing a pathway, not graduation. Students who complete their pathway prior to the twelfth (12th) grade will not be accurately tracked. They are instead documented as “continuing education” and no further information is collected on their employment status after graduation.

The number of Career and Technical Education (CTE) students reported by MDE in the Perkins IV Consolidated Annual Report (CAR) conflicts with the number reported by the SLDS, Lifetracks. There is a large disparity in the reported information for each data source. Further review revealed that Lifetracks and MDE are capturing information from different grades.

During the review, it was found that for the audit scope years 2017 and 2018, MDE reported the same numbers each year for enrolled participants and concentrators for Mississippi CTE secondary students. Erroneous data reporting can result in inaccurate payments, withheld payments, or sanctions.

Auditors also compared Lifetracks’ data on the number of CTE participators to what was reported by MDE in the 2015, 2016, 2017, and 2018 CARs. There appears to be inconsistent application of the terminology and resultant data measurement from one source to the other.

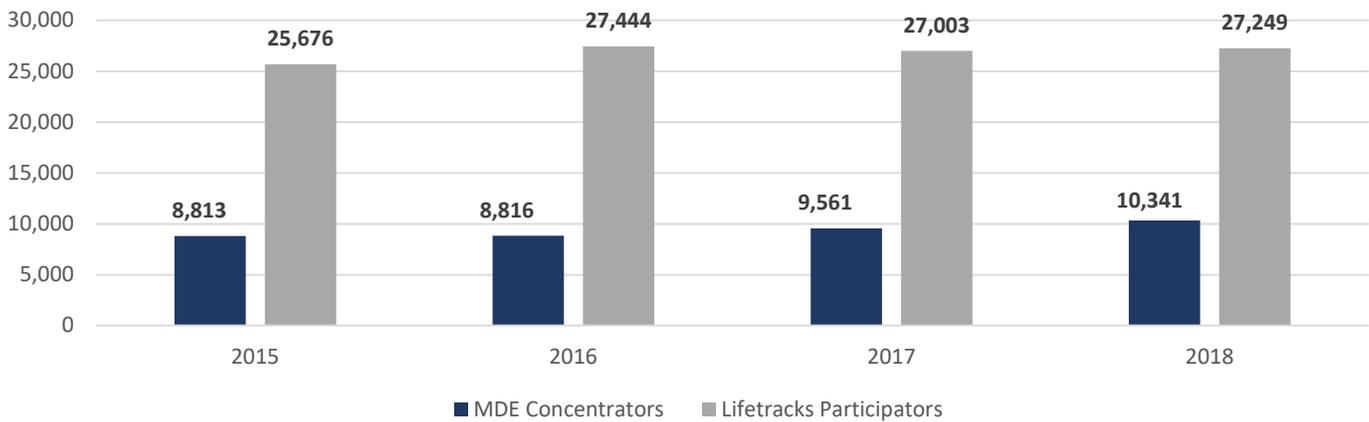
- Lifetracks’ report for secondary CTE participators defines the population as a CTE student who is pursuing the completion of a two-year, occupation-related CTE program of study.
- MDE’s CAR submitted for the *Perkins IV Act* defines the *Secondary CTE* participator as a student who has earned credit in 1 (one) or more courses in any CTE Workforce Development Program Area.

MDE’s definition of a *concentrator* is a student who is enrolled, but has not completed the second course of CTE in the same program area. It is more similar to Lifetracks’ definition of a *participator*; however, no measurement is the same.

- Lifetracks’ participator ad hoc report measures level 1 (1st year of course) and level 2 (2nd year of course) CTE students in grades 9-12.
- MDE CAR participators measures level 1 and 2 CTE students in grades 7-12.
- MDE CAR concentrators measures level 2 CTE students in grades 10-12.

The disparity between Lifetracks data and the MDE CAR report is shown in Exhibit 3 on page 6 below.

Exhibit 3
Lifetracks vs MDE CAR report



Source: Prepared by auditors using data provided by Lifetracks and the *MDE CAR Report (2015-2018)*
 Note: MDE measures concentrator enrollment for grades 10-12; Lifetracks measures participator enrollment for grades 9-12

OSA was unable to determine if the measurement of salaries for CTE graduates one year out of school is accurate and consistent. Auditors were able to determine the method that Lifetracks uses for calculating salaries, but could not verify the accuracy of the salary information due to COVID-19.

- How are graduates identified within the employment data?
- How are salaries of secondary CTE graduates matched to their wages?
- How are those salaries linked with their industries?

According to nSPARC (Lifetracks), the annual earnings for CTE high school graduates is calculated as follows:

- “identify graduates
 MDE CTE participators who graduated high school and did not enroll in a Mississippi public community college or Mississippi public university within 16 months of graduation;
- identify employed graduates
 a graduate is classified as employed if quarterly unemployment insurance wage data from MDES shows a wage within the 1st year after graduation; and
- average annual earnings
 for graduates employed within one year of graduating high school, the 2nd and 3rd quarters after the first employment quarter are used to calculate the average annual earnings.”

The employment data that MDES receives is through the employer's quarterly tax and wage records. Employers registered with MDES are required to submit quarterly gross earnings wage records for their employees during each calendar week the worker is employed. MDES does not receive occupational, demographic, or educational data with the wage records.

Due to the COVID-19 pandemic, the MDES Unemployment Insurance division that collects wage data is currently unable to assist with further information on how the salaries are actually linked to graduates in a specific industry. Therefore, a conclusion on the accuracy of the reported wage data cannot be determined at this time.

To summarize, policymakers and the public are being provided an incomplete assessment of CTE's effectiveness. The employment data of CTE completers prior to graduation are not being tracked. Also, MDE and Lifetracks are using different definitions for students in the program, and MDE has submitted duplicate numbers from the previous report years, meaning the outcome data for those student participants is not correct. Finally, the accuracy of salary information cannot currently be verified.

To verify employment data in nSPARC, inquiries were made with the Mississippi Department of Employment Security (MDES), as follows:

Recommendations

1. OSA recommends that MDE modify the MSIS Placement Report so that CTE pathway completers are added to the list upon graduation from high school, instead of when the pathway is completed. This will allow the student's employment after graduation to be accurately tracked.
2. MDE should develop a policy and related controls to assure supervisory review of reports prior to submitting data for use in the Consolidated Annual Report (CAR) to ensure that the submission is free from errors and/or duplications of previous years' data.
3. MDE's Office of Data Analysis and Reporting and the Office of Career and Technical Education should work closely with the SLDS to ensure data acquired from CTE programs is current and accurate. Definitions of student groups and measurements should be consistent in all reporting.
4. MDE's CAR report data and Lifetracks should both be derived from MSIS to ensure CTE programs are being measured consistently and accurately. For example, the State of Tennessee Department of Education's enrollment information is entered by district staff into the school information systems package and is extracted in the Education Information System, which is similar to the Mississippi Student Information System (MSIS). The information is displayed in eTIGER (Tennessee's CTE data reporting system). A similar procedure should be implemented by MDE for how Lifetracks obtains their data on CTE enrollment.
5. Mississippi Lifetracks should cite the limitations of the data being used to calculate the benchmarks published for the CTE program until the issues regarding data quality are resolved.
6. MDE's Internal Audit division should complete an annual audit of data used to measure CTE program success to ensure appropriate measures are used, as well as the accuracy and reliability as outlined in the Government Accountability Office's Grey Book titled *Assessing the Reliability of Computer-Processed Data*.
7. OSA should conduct a full performance audit of Mississippi State University's nSPARC and Mississippi Lifetracks once future legislative appropriations for SLDS have been established.

Matters for Legislative Consideration

1. Approximately 87% of CTE program funding is derived from the State of Mississippi, therefore the Legislature may wish to consider developing statutory language that requires MDE to develop a standard reporting mechanism, providing uniform definitions of performance measurements for the Career and Technical Education program with references for the source of the data used, method of calculation, and other items that will ensure clarity for readers to understand the data source, as well as ensure data quality and reliability. An example from the State of Tennessee is provided in the following link:
https://www.tn.gov/content/dam/tn/education/ccte/cte/cte_data_report_card_definitions.pdf

Other Matters: SLDS Governing Board Bylaws

The Statewide Longitudinal Data System Governing Board does not comply with their bylaws

Criteria:

Miss. Code Ann. §37-154-3 established the Statewide Longitudinal Data System (SLDS) Governing Board consisting of a representative from each agency or entity providing data into the system. The SLDS Governing Board is required to develop and promulgate all rules and regulations governing the activities of the Board in accordance with applicable state and federal laws. The Board is authorized to contract the management and maintenance of the system with a third party and ensure Board policies and procedures are enforced.

According to the SLDS Governing Board Bylaws,⁸ adopted on July 8, 2013, the Board shall meet at least three (3) times per state fiscal year and all meetings shall be in compliance with MS Code §25-41-11(1), also known as the *Open Meetings Act*. The *Act* states that minutes shall be recorded within a reasonable time not to exceed thirty (30) days after recess or adjournment and shall be open to public inspection during regular business hours.

SLDS Governing Board responsibilities:

1. identify critical research and policy questions that need to be addressed by education (P-20, pre-school through college completion) and workforce programs;
2. identify reports and other information that should be available to education, workforce entities, and other public stakeholders;
3. develop a funding mechanism for sustaining the system after it is developed;
4. define and maintain standards for privacy, confidentiality, and security of data; and

5. perform other advisory functions that are necessary for the successful continuation and management of the longitudinal data system.

The system was developed and is maintained by the National Strategic Planning and Analysis Research Center (nSPARC) at Mississippi State University. The initial agencies participating in the SLDS Governing Board and nSPARC have worked collaboratively to secure funding through the United States Department of Education. Since 2009, Mississippi has received \$17.5 million from the Statewide Longitudinal Data Systems Grant Program⁹ through the National Center for Education Statistics.

The 2015 grant included start-up funds for an Office of Research and Statistics. MDE operates the Office of Data Analysis and Reporting¹⁰ for the purpose of fulfilling data requests, state and federal data reports, and data analysis services to MDE program offices. The SLDS has not received legislative appropriations for fiscal years 2020 or 2021. Fiscal year 2020 was the final year for the five (5) year agreement with nSPARC. The University has committed to completing the agreement regardless of funding. Currently, there are no SLDS activities for fiscal year 2021. A diagram of how these entities relate to one another is provided in Exhibit 4 on page 9 below.

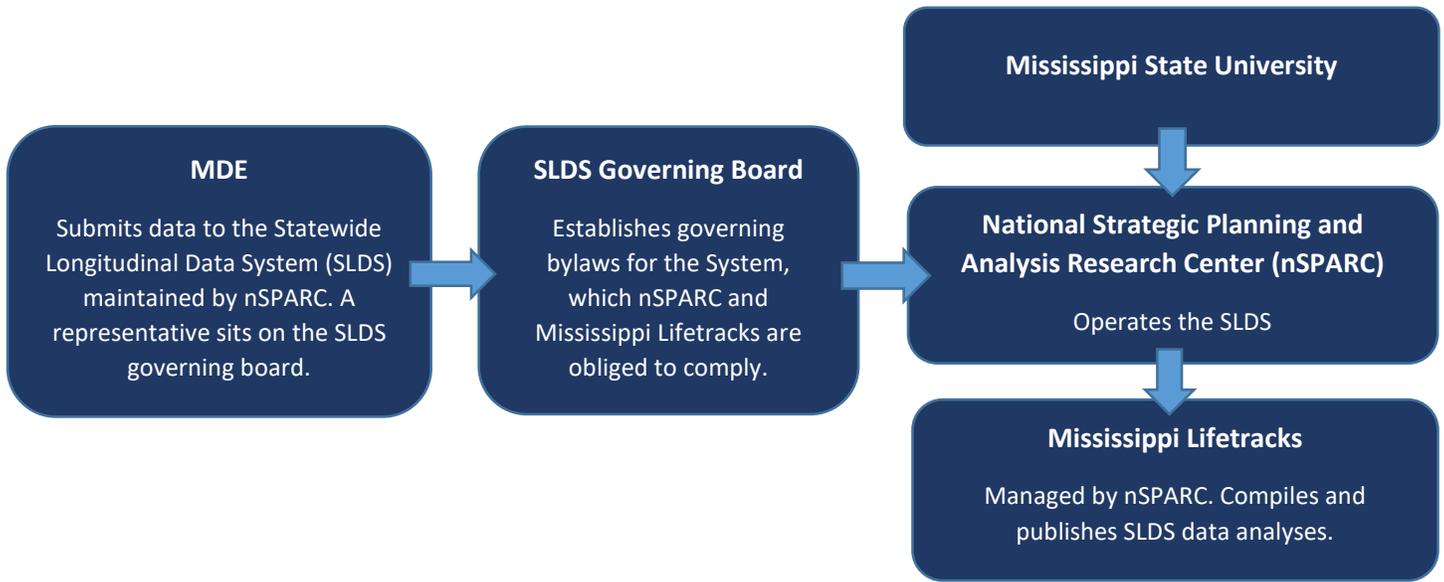
⁸ Lifetracks SLDS <https://lifetracks.ms.gov/pdfs/SLDS-Governing%20Board%20Bylaws-Adopted%202013-07-08.pdf>

⁹ IES National Center for Education Statistics <https://nces.ed.gov/programs/slids/state.asp?stateabbr=MS>

¹⁰ MDE Office of Data Analysis and Reporting <https://www.mdek12.org/OTSS/ODAR>

Exhibit 4

Entity Relationship: MDE; MSU; SLDS Governing Board; nSPARC; and Mississippi Lifetracks



Source: Prepared by auditors using information from MDE and nSPARC

The Mississippi Legislature has provided funding through the education budget starting in fiscal year 2014 to 2019, totaling \$8.2 million. The breakdown of funding is located in Exhibit 5 below.

Exhibit 5

Mississippi Statewide Longitudinal Data System/Lifetracks Funding

Date	Award	Grant Name
6/1/2009	\$3,387,308	MS PK-16 Longitudinal Data Initiative-MDE
7/1/2010	\$7,569,716	MS Integrated and Workforce Long. Data System-MDE
10/1/2015	\$6,588,210	MS PK-16 Data Initiative-MDE
Total:	\$17,545,234	
Date (FY)	Amount	Legislative Funding
2014	\$1,800,000.00	HB1648
2015	\$1,800,000.00	HB1476
2016	\$1,800,000.00	HB1536
2017	\$1,600,000.00	HB 1643
2018	\$800,000.00	HB 1502
2019	\$400,000.00	HB 1592
2020	\$0	No Appropriation
2021	\$0	No Appropriation
Total:	\$8,200,000.00	

Source: Prepared by auditors using data from Lifetracks

Condition, Cause, and Effect:

Meetings have not been posted on the Lifetracks’ website since April 10, 2017. Three (3) subsequent Board meeting minutes were not posted until late January 2020, the last being September 12, 2019. Therefore, the SLDS Governing Board has not complied with their bylaws, which are intended to promote transparency.

Additionally, the list of Board meetings indicated that there were no meetings for an eighteen (18) month period between September 14, 2017, and May 2, 2019. The Board met only once in the fiscal years 2017 through 2019. Meeting minutes from April 10, 2017, through May 2, 2019, were not posted to the Lifetracks website until January 2020 and after.

If they met and did not record their minutes within 30 days, as is required by the *Open Meetings Act (OMA)*, Miss. Code Ann. §25-41-11(1), then they would be in violation of said *Act*.

Failure to adhere to established bylaws, such as conducting mandated board meetings, signifies a weak control environment and could potentially result in failure to identify and correct important issues facing the Statewide Longitudinal Data System. The number of Board meetings and published minutes are shown in Exhibit 6 below.

**Exhibit 6
Board Meetings and Minutes**

Fiscal Years	2014	2015	2016	2017	2018	2019
Number of Board Meetings Indicated	6	3	3	1	1	1
Meeting Minutes Posted	5	3	3	1	1	1

Source: Prepared by auditors using data obtained from Lifetracks

Recommendation

1. Lifetracks’ Governing Board should follow established rules and regulations set forth in their bylaws or be disbanded for failure to comply with state law. Given the amount of data coming from MDE with regard to the Career and Technical Education program, it is imperative that the Board function as a proper oversight body. If the data being submitted to the SLDS cannot be trusted, then it defeats the purpose of the SLDS entirely.

Other Matters: Resources and Flexibility Needed

Instructor shortage, scheduling, rigorous academic testing, and early graduation present obstacles to enrollment & completion

Career pathways offered at each school can vary widely. School districts most often choose pathways based on student interest, funding, instructor availability, and local industry opportunities. Scheduling conflicts, low budgets, inadequate facilities, and instructor shortages can also play a role in the pathways offered. Sometimes the pathways offered may not be best suited to the students’ needs. School district surveys revealed that the communication and technical assistance provided to them by the Office of Career and Technical Education has been improving from previous years.

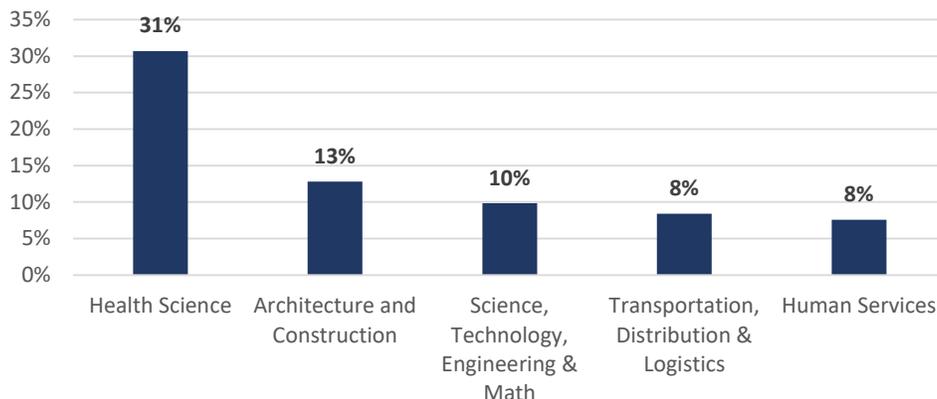
Surveys were sent to the fifteen (15) sampled school districts requesting a list of all pathways offered in their districts and to provide an explanation for why certain pathways were not offered. The surveys revealed a variation of pathways offered at school districts, with explanations including: lack of funding; lack of local industry/jobs to support a pathway; competition with dual credit academic courses; building capacity; and low enrollment/interest in a pathway. In addition, it was found that some school district CTE programs have

formed partnerships with local community colleges allowing students to attend a career technical class that is not offered in the district’s career tech facility.

Auditors recorded the CTE pathways of each student sampled at the fifteen (15) school districts. **Health Science** had the highest number of completers, followed by **Architecture and Construction**, and **Science, Technology, Engineering and Math**. The bottom three (3) pathways with the lowest enrollment in the sampled school districts were **Finance**, **Marketing**, and **Information Technology**. The low enrollment for these pathways may be due to a low number of school districts in the sample offering these courses and may not reflect a lack of student interest.

The top five (5) pathways for completers in the sample of students is shown in Exhibit 7 below. The most chosen pathways in each region and in the State, as well as the number of students in the sample population who received a certification in their pathway can be found in Appendix C.

Exhibit 7
Average percentage of pathways selected by students
(15 School Districts, 2015-2018)



Source: Prepared by auditors using data provided by school districts

In addition to the surveys, interviews were conducted on-site with district CTE directors. They revealed several additional obstacles to student enrollment and completion of a pathway such as shortage of instructors, student scheduling, rigorous academic testing, and early graduation. MDE has a *Local Plan Update* process each Spring where school districts can request approval of new and conversion programs. The Office of Career and Technical Education assists them in determining those programs.

Because not all pathways are available to each student, some students will miss the opportunity to gain a skill in an occupation that is of most interest to them. Although it may not be practical or feasible for a school district to offer all pathways, MDE should continue to provide

school districts with assistance in making the best pathway choices available to students.

MDE has begun using the comprehensive local needs assessment (CLNA) that is now mandated through the *Perkins Act*. The CLNA is being used to assist local school districts in identifying appropriate pathways. Meetings were held during the 2019-2020 school year so that secondary and post-secondary CTE directors would analyze local labor market data in order to determine the pathways that were needed in each area of the State.

MDE states that it is currently working with Hanover Research to gather data on the pathways needed in each region so they will have another data source to assist districts in making programmatic decisions.

APPENDIX A: MDE Management Response



MISSISSIPPI DEPARTMENT OF EDUCATION

Carey M. Wright, Ed.D.
State Superintendent of Education

July 15, 2020

Mr. Shad White, State Auditor
Office of the State Auditor
Post Office Box 956
Jackson, MS 39205-0956

Dear Mr. White:

The Mississippi Department of Education (MDE) has reviewed the Office of the State Auditor's (OSA) performance audit report for the Office of Career and Technical Education (CTE), completed between October 2019 and July 2020. The MDE disputes the OSA report because it contains inaccurate findings and it holds MDE responsible for work conducted by the National Strategic Planning and Research Center (nSPARC) at Mississippi State University. The MDE has the following concerns with the audit report:

- nSPARC and Lifetracks are not under the jurisdiction of the MDE. The MDE is not responsible for the actions and/or guidelines of Lifetracks' governing board. Any findings regarding nSPARC and Lifetracks should be in a separate report.
- The data comparisons (Page 5, Exhibit 3) for CTE participants and concentrators as measured by the MDE and nSPARC are not valid because two different groups of students were included in the calculations.

Attached is a response to the draft report that outlines our concerns. We look forward to seeing the final report released, and we are requesting that our response be included as an addendum to the final OSA report.

Regards,

Handwritten signature of Carey M. Wright in black ink.

Carey M. Wright, Ed.D.
State Superintendent of Education

Attachments:

Management Responses to the State Auditor

Mississippi Department of Education
 Management Responses to the
 Office of the State Auditor
 Career and Technical Education (CTE) Performance Audit

AUDITOR COMMENT	MDE RESPONSE
<p>Executive Summary (no page number)</p> <p>Finding 4: The data utilized by MDE and Lifetracks to measure program success are conflicting.</p> <p>Recommendation 6-7:</p> <p>Developing a standard reporting mechanism for the CTE program; and following Lifetracks' governing board guidelines or risk being disbanded.</p>	<p>nSPARC and Lifetracks are not under the jurisdiction of the MDE. As such, reports for these entities should not be included in an MDE audit report. The MDE submits data in accordance with federal reporting requirements under the Perkins Act. While the MDE is willing to work with nSPARC to build an understanding of how MDE data are reported, the agency is not responsible for the methodology that Lifetracks establishes for data collection, analysis, and reporting.</p> <p>MDE is not responsible for actions and/or guidelines of Lifetracks' governing board.</p>
<p>Page 4</p> <p>Lifetracks also asserts that it is an interoperable data system that securely and efficiently facilitates research and analysis that will enhance the state's ability to link, match, and share education and workforce data leading to an enriched ability within the state to improve career-readiness outcomes and enhance success in the economy.</p>	<p>A manual process is required for the MDE to exchange data from the Mississippi Student Information System (MSIS) with Lifetracks. The MDE does not view this process as an interoperable data exchange.</p> <p>nSPARC and Lifetracks are not under the jurisdiction of the MDE. As such, reports for these entities should not be included in an MDE audit report.</p>
<p>Page 5</p> <p>The number of Career and Technical Education (CTE) students reported by MDE in the Perkins IV Consolidated Annual Report (CAR) conflicts with the number supported by</p>	<p>The MDE followed the definitions of a CTE participant and concentrator as defined in the state's Perkins IV plan, to meet Section 113(c)(1)-(2) of <i>The Carl D. Perkins Career and Technical Education Act of 2006</i>. During Perkins IV, CTE participants were students completing one course in CTE, and CTE concentrators were students who enrolled but had</p>

AUDITOR COMMENT	MDE RESPONSE
<p>the [State Longitudinal Data System] SLDS, Lifetracks.</p>	<p>not yet completed the second course of CTE in the same program area.</p> <p>Exhibit 3 is not a valid comparison because it reflects two different groups of students. The MDE concentrator statistics reflect only CTE students who enrolled in the second year of a CTE program while the Lifetracks participator statistics reflect students enrolled in both the first and second year of a CTE program. For this to be a fair comparison, the chart needs to be modified to include MDE CTE participants for years 2015-2018. Furthermore, nSPARC and Lifetracks are not under the jurisdiction of the MDE.</p>
<p>Page 5</p> <p>During the review, it was found that for the audit scope years 2017 and 2018, MDE reported the same numbers each year for enrolled participants and concentrators (students who completed one year of a pathway and are enrolled in the second year of the same pathways) for Mississippi Secondary CTE students.</p> <p>Page 6</p> <p>MDE has submitted duplicate numbers for the previous report years, meaning the outcome data for those student participants as not correct.</p>	<p>Former staff within the Office of Career and Technical Education uploaded duplicate completer and participant data for the 2017 and 2018 CAR reports. The data for each year was reexamined and reporting has been updated to include the correct data.</p> <p>The Office of Career and Technical Education employed a new CTE State Director and a new Director for Compliance and Reporting in 2019. Both individuals are working to ensure that protocols are in place to ensure the correct calculations and submissions of CTE data.</p>
<p>Page 6</p> <p>OSA was unable to determine if the measurement of salaries for CTE graduates one year out of school is accurate and consistent.</p>	<p>The MDE was not required to collect salary data under Perkins IV. Any data that is available on salaries is calculated by nSPARC and this information should be included in a separate audit report of nSPARC.</p>

AUDITOR COMMENT	MDE RESPONSE
<p>Page 7</p> <p>Recommendation 5: Mississippi Lifetracks should cite the limitations of the data being used to calculate the benchmarks published for the CTE program until the issues regarding poor data quality are resolved.</p>	<p>The difference in data being reported is not a matter of poor data quality, but a matter of clarifying different definitions, data sets, and use cases. The MDE will work to ensure Lifetracks has the definitions used for Perkins Act reporting, should Lifetracks choose to report this same data on their website.</p>

APPENDIX B: OSA Response



**STATE OF MISSISSIPPI
OFFICE OF THE STATE AUDITOR**

Shad White
STATE AUDITOR

July 21, 2020

Dr. Carey M. Wright, Ed.D., State Superintendent of Education
Mississippi Department of Education
P.O. Box 771
Jackson, MS 39205-0771

Dear Dr. Wright,

On July 15, 2020, the Office of the State Auditor (OSA) sent the Mississippi Department of Education (MDE) the final draft of the performance audit report on the Office of Career and Technical Education for review. The Mississippi Department of Education was asked to provide the Office of the State Auditor with their views concerning the findings, conclusions, and recommendations that involve MDE, as well as any planned corrective actions in the form of a formal written response.

The original objective of this project was to evaluate the effectiveness of the of the Career and Technical Education (CTE) program. In order to measure the effectiveness of the program, auditors requested outcome data from MDE and other sources statutorily mandated to measure program success. According to the Government Accountability Office's *Government Auditing Standards*,

"performance audit objectives vary widely and include assessments of program effectiveness, economy, and efficiency; internal control; compliance; and prospective analyses. Audit objectives may also pertain to the current status or condition of a program. These overall objectives are not mutually exclusive."

Lifetracks and the Statewide Longitudinal Data System (SLDS) are a major source of data for the shareholders to view the success of CTE students in Mississippi. There is a Memorandum of Understanding between MDE and Lifetracks to share CTE data that will be published for public consumption. OSA is aware that MDE does not have jurisdiction over nSPARC (Lifetracks), which is why information regarding Lifetracks is presented separately in the report. Page four (4) of the report, specifically, states that nSPARC is a separate entity from MDE. In addition, auditors note that MDE is not responsible for Lifetracks' data methodology.

Regarding the data comparisons on page five (5) of the report, which addresses the disparity between data sets: the measurements may be accurate, but the definition of the measurement without complete transparency is not painting an accurate picture of success. Since each entity's definition is similar, but the measurements are different, the data are confusing to stakeholders. The primary goal for both entities should be the accurate measurement of CTE program outcomes and the definition of success for both should be the same. OSA has responded to MDE's concerns in the table below.

Regards,

Shad White
State Auditor

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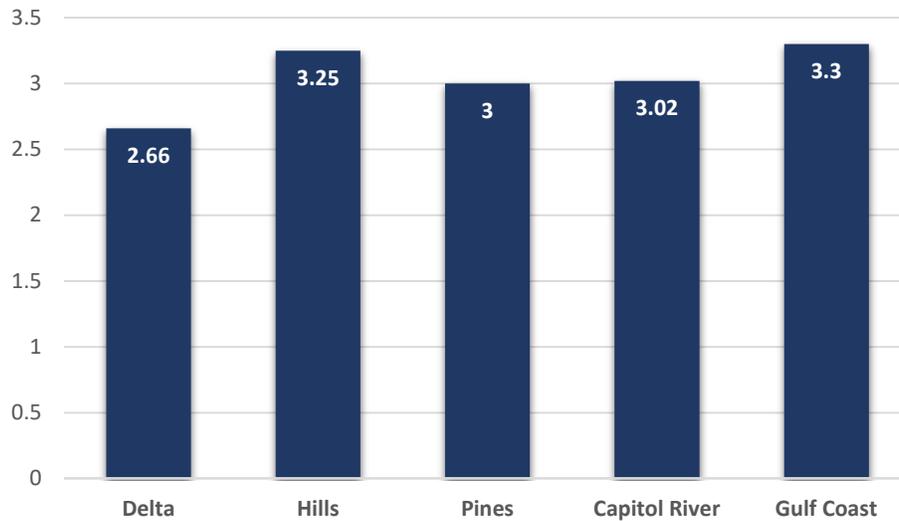
AUDITOR COMMENT	MDE RESPONSE	AUDITOR RESPONSE
<p>Executive Summary (no page number) Finding 4: The data utilized by MDE and Lifetracks to measure program success are conflicting. Recommendation 6-7: Developing a standard reporting mechanism for the CTE program; and following Lifetracks’ governing board guidelines or risk being disbanded.</p>	<p>nSPARC and Lifetracks are not under the jurisdiction of the MDE. As such, reports for these entities should not be included in an MDE audit report. The MDE submits data in accordance with federal reporting requirements under the Perkins Act. While the MDE is willing to work with nSPARC to build an understanding of how MDE data are reported, the agency is not responsible for the methodology that Lifetracks establishes for data collection, analysis, and reporting. MDE is not responsible for actions and/or guidelines of Lifetracks’ governing board.</p>	<p>It was noted in the revised report that MDE and Lifetracks are separate entities, and that MDE is not responsible for Lifetracks.</p>
<p>Page 4 Lifetracks also asserts that it is an interoperable data system that securely and efficiently facilitates research and analysis that will enhance the state’s ability to link, match, and share education and workforce data leading to an enriched ability within the state to improve career-readiness outcomes and enhance success in the economy.</p>	<p>A manual process is required for the MDE to exchange data from the Mississippi Student Information System (MSIS) with Lifetracks. The MDE does not view this process as an interoperable data exchange. nSPARC and Lifetracks are not under the jurisdiction of the MDE. As such, reports for these entities should not be included in an MDE audit report.</p>	<p>Measuring the effectiveness of the CTE program involves more than one entity, so it is appropriate to include them in the report. MDE should only be concerned with issues and recommendations that are directed at MDE. It has been stated in the report that MDE is not responsible for Lifetracks. Also, the Lifetracks website claims their platform is interoperable. The statement was not made that MDE’s data was interoperable.</p>
<p>Page 5 The number of Career and Technical Education (CTE) students reported by MDE in the Perkins IV</p>	<p>The MDE followed the definitions of a CTE participant and concentrator as defined in the state’s Perkins IV</p>	<ul style="list-style-type: none"> • Lifetracks and MDE have an MOU. • Lifetracks pulls data from MSIS.

<p>Consolidated Annual Report (CAR) conflicts with the number supported by the SLDS, Lifetracks</p>	<p>plan, to meet Section 113(c)(1)-(2) of <i>The Carl D. Perkins Career and Technical Education Act of 2006</i>. During Perkins IV, CTE participants were students completing one course in CTE, and CTE concentrators were students who enrolled but had not yet completed the second course of CTE in the same program area.</p>	<ul style="list-style-type: none"> • The definition Lifetracks uses on their website for their information on the number of CTE students is similar to what MDE’s definition of a completer is, but the measurements are not the same. • MDE and Lifetracks should collaborate regarding the data to be pulled from MSIS to ensure consistency between data sets for outcome measurement.
<p>Page 5 During the review, it was found that for the audit scope years 2017 and 2018, MDE reported the same numbers each year for enrolled participants and concentrators (students who completed one year of a pathway and are enrolled in the second year of the same pathways) for Mississippi Secondary CTE students.</p> <p>Page 6 MDE has submitted duplicate numbers for the previous report years, meaning the outcome data for those student participants as not correct.</p>	<p>Former staff within the Office of Career and Technical Education uploaded duplicate completer and participant data for the 2017 and 2018 CAR reports. The data for each year was reexamined and reporting has been updated to include the correct data.</p> <p>The Office of Career and Technical Education employed a new CTE State Director and a new Director for Compliance and Reporting in 2019. Both individuals are working to ensure that protocols are in place to ensure the correct calculations and submissions of CTE data.</p>	<p>OSA approves</p>
<p>Page 6 OSA was unable to determine if the measurement of salaries for CTE graduates one year out of school is accurate and consistent</p>	<p>The MDE was not required to collect salary data under Perkins IV. Any data that is available on salaries is calculated by nSPARC and this information should be included in a separate audit report of nSPARC.</p>	<p>The report does not mention that MDE is responsible for salary data. The MDES is our source for wage data.</p>

<p>Page 7 Recommendation 5: Mississippi Lifetracks should cite the limitations of the data being used to calculate the benchmarks published for the CTE program until the issues regarding poor data quality are resolved.</p>	<p>The difference in data being reported is not a matter of poor data quality, but a matter of clarifying different definitions, data sets, and use cases. The MDE will work to ensure Lifetracks has the definitions used for Perkins reporting, should Lifetracks choose to report this same data on their website.</p>	<p>The quality of data is measured by its accuracy and reliability. Output is only as good as input. Working together with Lifetracks to measure and define the same set of students will provide more reliable data available to stakeholders.</p>
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APPENDIX C

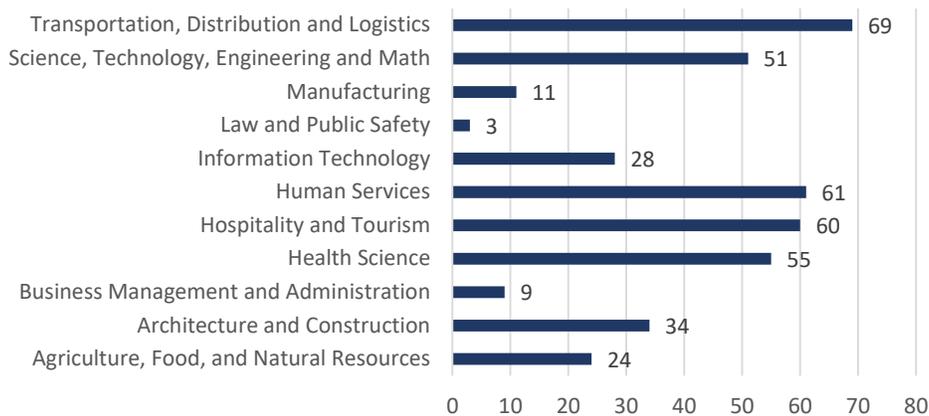
Average GPA per Region (15 school districts, 2015-2018)



Source: Prepared by auditors using data provided by school districts

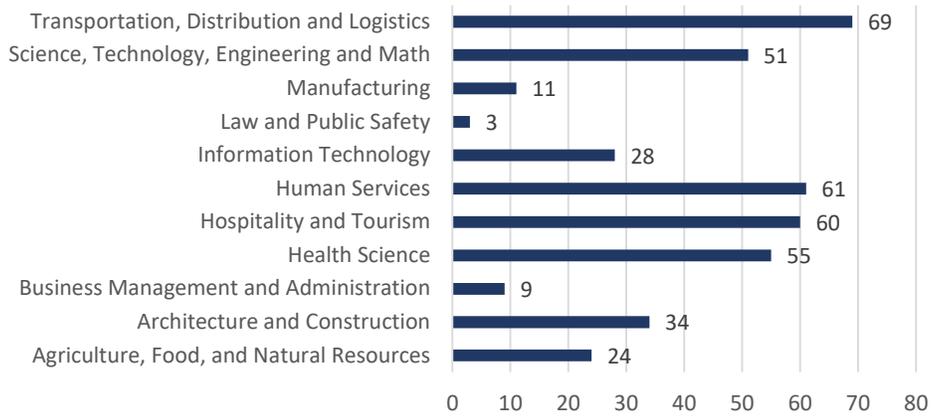
Average pathway enrollment by region for school years 2015-2018

Average pathway enrollment in the *Delta* region (2015-2018)



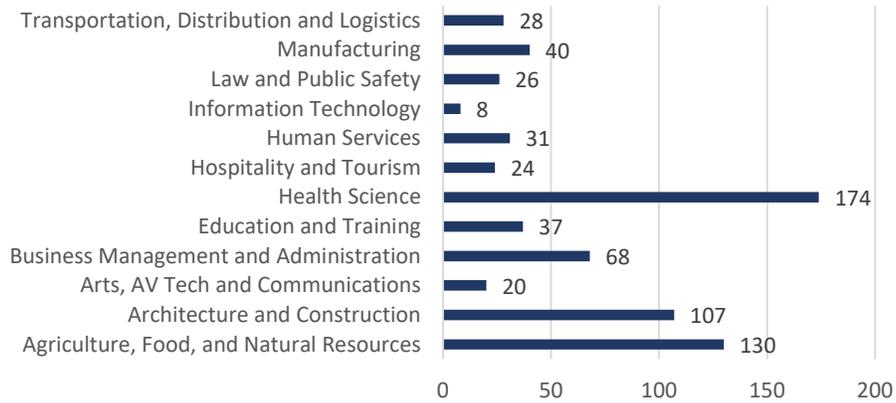
Source: Prepared by auditors using data provided by school districts

**Average pathway enrollment in the Hills region
(2015-2018)**



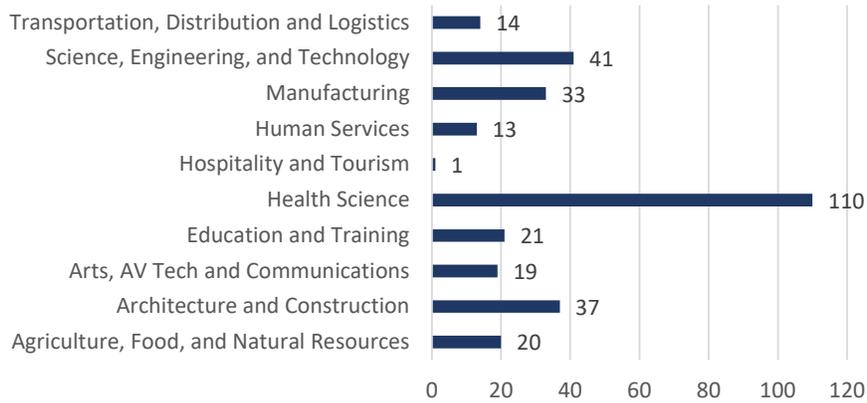
Source: Prepared by auditors using data provided by school districts

**Average pathway enrollment in the Pines region
(2015-2018)**



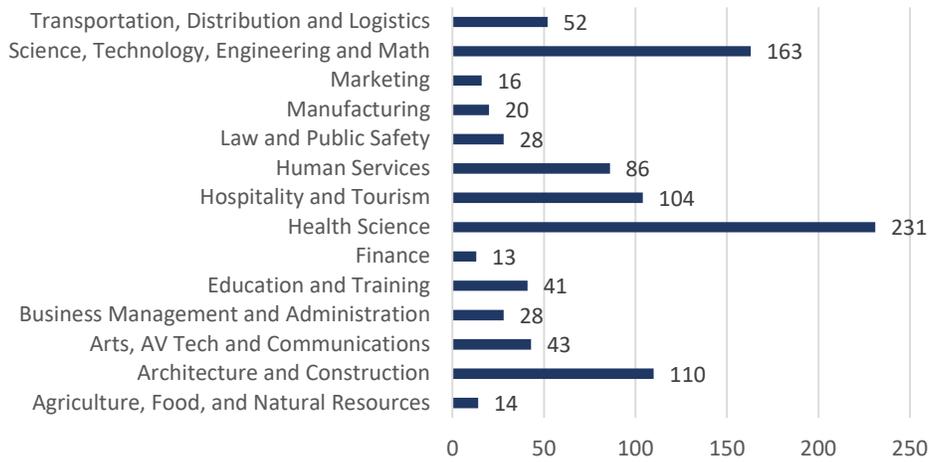
Source: Prepared by auditors using data provided by school districts

**Average pathway enrollment in the Capitol River region
(2015-2018)**



Source: Prepared by auditors using data provided by school districts

**Average pathway enrollment in the Gulf Coast region
(2015-2018)**



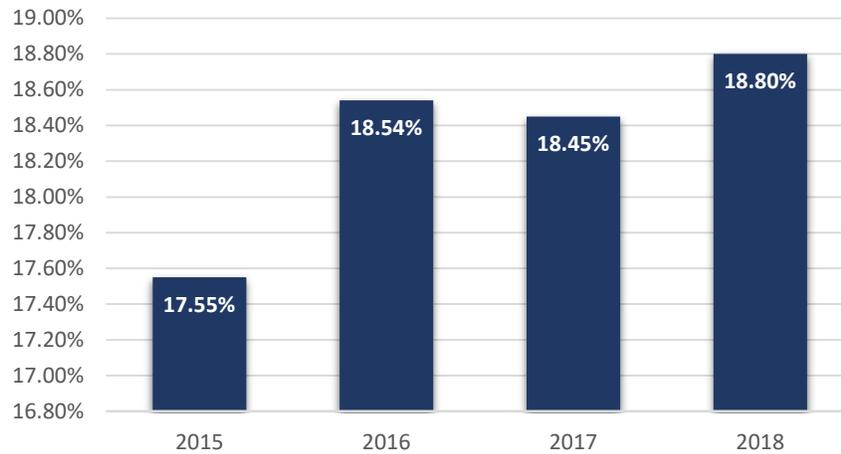
Source: Prepared by auditors using data provided by school districts

**Total number of students earning certifications
(15 school districts, 2015-2018)**

2015	2016	2017	2018
10	26	29	20

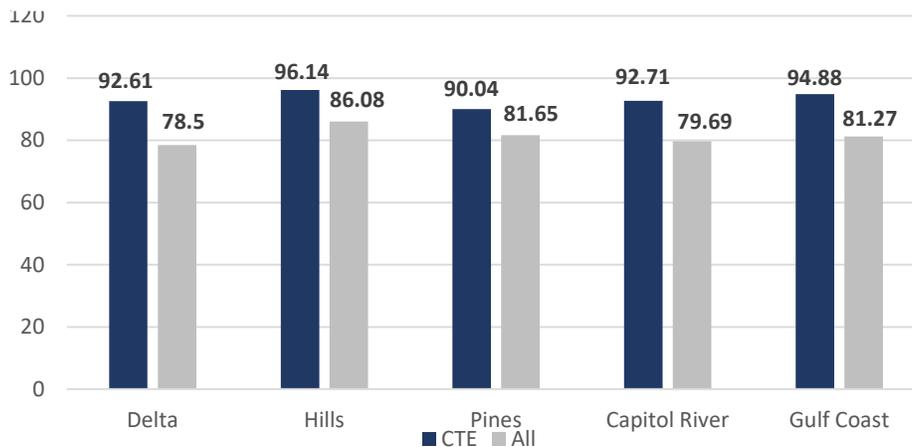
Source: Prepared by auditors using data obtained from school districts

Percentage of high school students enrolled in a CTE program (2015-2018)



Source: Prepared by auditors using data obtained from MDE and Lifetracks

**Average graduation rate of sample population
by CTE program completers vs all students
(15 school districts, 2015-2018)**



Source: Prepared by auditors using data provided by MDE

Lifetracks Benchmark Measurements

	2014-2015	2015-2016	2016-2017	2017-2018
Graduates Employed in the Workforce-1 year	65.99%	68.54%	64.29%	63.15%
CTE Students At Risk	4,774	5,012	4,379	4,556
Graduation Completion Rate	83.42%	86.24%	87.91%	86.64%
Benchmarks from <i>Building a Better Mississippi</i>				
% of HS Students Enrolled in a CTE Program	17.55% (25,676 total)	18.54% (27,444 total)	18.45% (27,003 total)	18.8% (27,249 total)
% of HS Students Enrolled in CTE Programs who earn an approved Industry Certification, by career pathway (Excluding WIA Training, CCWF training and Vocational Rehabilitation)	2.48% (55 total)	2.15% (52 total)	2.56% (70 total)	2.3% (66 total)
% of Students Earning Industry Approved Certification who obtain a job in MS in their area of certification	65.99%	68.54%	64.29%	63.15%
Average Starting Salary of Students earning an approved Industry Certification who obtain a job in MS in their area of certification	\$14,564	\$14,392	\$15,190	\$15,353

Source: Prepared by auditors using data obtained from Lifetracks

APPENDIX D

Report Details

Additional Background

Career and Technical Education students can earn certifications in three of the pathways: National Center for Construction Education and Research (NCCER)¹¹ (**Architecture and Construction**), the National Restaurant Association (ProStart®)¹² (**Hospitality and Tourism**), and the National Institute for Automotive Service Excellence (ASE)¹³ (**Transportation, Distribution and Logistics**). All students can take the ACT WorkKeys National Career Readiness Certificate¹⁴ exam which measures and certifies that the student has essential work skills needed for success in jobs across industries and occupations. However, the ACT WorkKeys does not certify that the student is proficient in a specific pathway. Students must first pass the occupational-specific portion of the Mississippi Career Planning and Assessment System known as MS-CPAS-3¹⁵ before testing for certifications in their chosen pathway. The exam is used to measure technical skill attainment for the pathway.

Mississippi Secondary CTE students must complete a minimum of 21 credits to graduate¹⁶ under the career pathway option. Many students that enroll and complete a pathway can choose the traditional pathway option; however, that option requires 24 minimum credit hours. The auditor chose to verify the minimum of 21 credits of the career pathway option for the completers in the sample of students from each school district. The graduation requirements for school years **2015-2018** are as follows:

- 4 Credits of English;
- 3 Credits of Math;
- 3 Credits of Science;
- 3 Credits of Social Studies;
- 0.5 Credit of Health/Physical Education;
- 1 Credit of Integrated Technology;
- 4 Credits of Career and Technical Education Electives; and
- 2.5 Credits of Electives.

Additionally, graduation requirements have changed for the 9th grade class of 2018. They are now required to complete 24 credits for the traditional diploma. A student may earn the CTE Diploma Endorsement by earning:

- an overall GPA of 2.5;
- silver or higher on the ACT WorkKeys;
- four credits of CTE in the same program area;
- two additional credits for a total of 26; and
- CTE dual credit or Work-Based Learning credit or attainment of a national certification approve by State Board of Education.

¹¹ National Center for Construction Education and Research www.nccer.org

¹² National Restaurant Association www.chooserestaurants.org/prostart

¹³ Automotive Service Excellence www.ase.com/home

¹⁴ ACT WorkKeys www.act.org/content/act/en/products-and-services/workkeys-for-job-seekers/assessments.html

¹⁵ MS-CPAS <https://www.rcu.msstate.edu/Assessment/MS-CPAS.aspx>

¹⁶ Mississippi High School Graduation Pathways <https://mdek12.org/sites/default/files/mississippi-high-school-nbsp-graduation-pathway.pdf>

Note: these new requirements were not in place for OSA's review of the audit scope years 2015-2018 graduating senior transcripts.

The MDE policy and procedure manual, Rule 84.3, states that the Office of Career and Technical Education shall assist the local educational agencies (LEA) by monitoring a minimum of ten percent (10%) of all LEAs annually and by responding to any request for specific assistance. Monitoring activities may include:

1. state-level desk review;
2. on-site review;
3. review of local annual program plans and other related information; and
4. follow-up on previously reviewed LEAs to determine how well they may be following their remedial plans.

nSPARC Methodology for calculating average earnings if the graduate was in the 1st quarter.

- average annual earnings
 - for graduates employed within one year of graduating high school, the 2nd and 3rd quarters after the first employment quarter are used to calculate the average annual earnings.
 - i.e., if a CTE graduate was in the 1st quarter, then the annualized earnings will equal the 2nd quarter of wages plus the 3rd quarter of wages multiplied times two
 - if (employed in the 1st quarter) then annualized earnings = (2nd quarter wage + 3rd quarter wage) * 2

Objectives, Scope, Methodology

Objectives:

In this report, auditors attempted to answer the following question(s):

1. Are the programs meeting the intended outcomes?
2. Are the programs being tracked and monitored appropriately?
3. Are the requirements outlined in state law being met?
4. Are the data submitted by MDE, MDA, and MDES to Mississippi Lifetracks (SLDS) accurate when compared to the sample population?

Additional questions considered:

- What is the average salary of a student who earns an industry approved certification and obtains employment in Mississippi?
- What funding does Mississippi receive for Career and Technical Education?

Scope: Auditors determined whether educators are adhering to the CTE state law requirements for setting educational standards and benchmarks, as well as assessed the methodology for measuring program impact. The audit covered the school years 2014-2015, 2015-2016, 2016-2017, and 2017-2018.

Methodology: Auditors tested career and technical education student transcripts who were graduating seniors that completed a career pathway for the scope years for fifteen (15) school districts in the state. Transcripts were reviewed to assess whether students met minimum graduation requirements. Auditors noted the students' career pathway and any certifications earned. Additional methodology included the following:

- reviewed state statutes and federal laws regarding CTE programs;
- reviewed the Mississippi Department of Education's (MDE) reporting documentation in compliance with the *Perkins Act* and in accordance with the Mississippi State Plan;
- assessed *Perkins Act* reporting requirements and the State Plan;
- randomly selected fifteen (15) school districts across the state from five (5) regional areas;
- evaluated all CTE programs in the fifteen (15) school districts sampled;
- surveyed school districts requesting the criteria used to determine at-risk students, and report the graduation rate for CTE and non-CTE students;

- conducted interviews with CTE personnel to gain an understanding of how each school district operates their program;
- compared similar GPAs of at-risk students in CTE programs to non-CTE at-risk students and their graduation rates to determine differences in program completions;
- conducted data analyses from multiple sources (i.e., Lifetracks Statewide Longitudinal Data System (SLDS), and the Perkins Collaborative Resource Network); and
- compared raw data from MDE to Mississippi Lifetracks (SLDS).

About the Office of the State Auditor and the Performance Audit Division

The Mississippi Constitution grants specific duties and powers related to prescribing systems of accounting, budgeting, and financial reporting for public offices in Mississippi. It also enumerates other statutory responsibilities including study and analysis of existing public managerial policies and practices; pre-audit and post-audit functions; investigation of suspected fiscal violations; recovering misspent and stolen funds; and a variety of related duties and responsibilities. The mission of the Office of the State Auditor is to serve its customers and protect the public's trust by independently assessing state and local governmental and other entities to ensure that public funds are properly received, are legally, effectively, and efficiently spent and are accounted for and reported accurately.

Performance audits provide objective analysis to assist those charged with governance and oversight to improve program performance and operations, reduce costs, facilitate decision making, and contribute to public accountability. The mission of the performance audit division is to provide useful information to the public, program leadership, and elected officials in order to hold state government accountable for its performance by identifying and recommending specific actions to address issues related to the efficiency, effectiveness, and economy of state agencies and programs. Audits by the Performance Audit Division are planned and performed to obtain sufficient, appropriate evidence to provide a reasonable basis for findings and conclusions based on established audit objectives.

This report was produced by the Mississippi Office of the State Auditor in accordance with Mississippi Statute 7-7-211 and is available on the State Auditor's website at www.osa.ms.gov.

Mississippi Office of the State Auditor

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