



MLDS CENTER

Maryland Longitudinal
Data System

Better Data • Informed Choices • Improved Results

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2022 Annual Report on the Maryland Longitudinal Data System and Center

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This Annual Report of the Governing Board of the Maryland Longitudinal Data System Center is submitted to the Governor and the Maryland General Assembly in compliance with Education Article § 24-705 of the Annotated Code of Maryland.

Table of Contents

Table of Contents	1
Highlights	3
Introduction	4
Section 1. Implementation of the MLDS and Activities of the Center	4
1.1 System Implementation and Management	4
A. Records Count	4
B. Match Rate	5
C. Data Center Move	5
D. Systems Security	6
1.2 Activities of the Center	7
A. Stakeholder Engagement	7
B. Data Requests	9
C. Research Series	10
D. Presentations	14
E. Census Data	16
F. Workforce Data Quality Initiative Grant Update	17
G. Conferences	18
H. Exploring Data Sharing Partnership with the Division of Correction	19
I. Commission to Study the Health Care Workforce Crisis in Maryland	19
J. AIB Blueprint Teacher Prep Workgroup	20
K. MicroSoft Certification Data	20
L. Research Agenda Revision	20
M. Published Research	21
N. Grant Funding	21
Section 2. List of All Studies Performed by the Center	22
2.1 Research	22
A. Applying Data Science Methods to Inform Maryland Policy	22
B. Justice-Involved Students	23
C. Public School Suspensions	23
D. Dual Enrollment	24
E. Comptroller Data Analysis	24
F. Teacher Diversity	24

G. Chronic Teacher Attrition	25
H. High School Grade Retention	26
I. Computer Science Education	26
J. Baltimore City - Launching Into Adulthood	27
K. Promise Neighborhoods	27
L. Student Transfer	27
M. Music Education and Teaching	27
N. Workforce Outcomes	28
O. Positive Behavioral Intervention and Supports (PBIS)	28
2.2 Dashboards and Interactive Reports	28
A. College Enrollment Patterns	28
B. High School Persisters Summary Report	29
C. Brain Gain	29
D. Annual Reports for the Department of Legislative Services	30
E. Other Stakeholder Reports	30
2.3 Reports	30
A. Dual Enrollment Reporting	30
B. Career Preparation Expansion Act Report	30
C. Blueprint Teacher Preparation and Diversity Report	31
D. Out-of-Home Placement and Higher Education Participation	31
E. Montgomery College Graduate Outcomes	32
Section 3. Data Determined to be Unnecessary	32
Section 4. Proposed or Planned Expansion of Data	32
A. Juvenile Delinquency	32
B. Child Welfare	33
C. Credentials	33
D. Correctional Education	34
E. High School Data	34
F. Teacher/Staff Data	34
G. Attendance Data	35
H. Literacy, Adult, and Community Education System (LACES) Data from Labor	35
I. Maryland Health Occupation Boards and Commissions	35
J. Grads2Careers Data from Baltimore’s Promise - External Temporary Data	36
K. Baltimore City School Choice Data	36
Section 5. Recommendations Made by the Governing Board	37

Highlights

- ★ The MLDS Governing Board approved 171 new data elements to the MLDS *Data Inventory*. New sources of data include child welfare data, health occupation licensure data, and Microsoft certification data.
- ★ The MLDS Center supported its Research Branch and external researchers in their applications for grant funds. In FY 2022, two projects were awarded funding totaling \$3.1 million. This year the Research Branch submitted an application for a U.S. Department of Education grant to support research on teacher career pathways.
- ★ The MLDS Center continues to provide support, research, and analysis for state agencies and colleges, including numerous data requests that were needed to meet state and federal reporting requirements.
- ★ The MLDS Center, with the support of the Department of Information Technology (DoIT), successfully migrated the MLDS data system to DoIT's enterprise data center. The move included a full technology refresh that will enhance system performance and accommodate anticipated system growth. The new data center adds additional physical security and provides seamless integration with DoIT managed services.
- ★ Two new legislatively mandated reports were completed and submitted to the Governor and General Assembly: (1) *Progress in Increasing the Preparation and Diversity of Teacher Candidates and New Teachers in Maryland* (a requirement of the *Blueprint for Maryland's Future* and also submitted to the Accountability and Implementation Board); and (2) *Out-of-Home Placement and Higher Education Participation Report*.
- ★ The MLDS Center successfully created and launched a software utility that converts student addresses into census block and tract numbers. The use of the utility thus far has resulted in 97% of addresses being successfully converted to Census block and tract numbers.
- ★ The MLDS Center Research Branch had four articles published in prestigious academic journals; demonstrating the high quality of work being produced by the researchers.

Introduction

This Annual Report is submitted in fulfillment of the requirement under Education Article, §24-705, Annotated Code of Maryland. The Governing Board must provide information to the Governor and General Assembly annually on the following:

1. An update on the implementation of the MLDS and activities of the MLDS Center;
2. List of all studies performed by the Center during the reporting period;
3. List of all currently warehoused data that are determined to be no longer necessary to carry out the mission of the Center;
4. Any proposed or planned expansion of data maintained in the database; and
5. Any other recommendation made by the Governing Board.

The following sections of the report will address each of the five statutorily required topics.

Section 1. Implementation of the MLDS and Activities of the Center

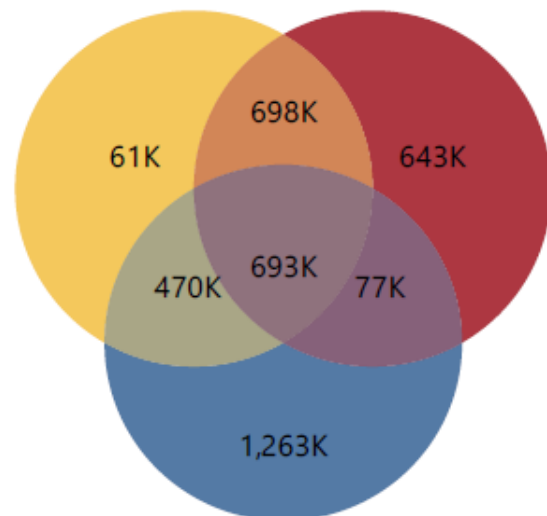
1.1 System Implementation and Management

A. Records Count

As of November 2022, the MLDS contained records for 3,905,411 unique individuals. Table 1, below provides the number of individual records provided by each data partner agency that provide identity establishing data collections.

Table 1 and Figure 1 - Number of Individual Records in the MLDS by Data Source and Sector Linking

Source	Count as of Nov 2022
MHEC █	2,111,844
MSDE █	2,503,018
Labor █	1,922,183



Approximately 693,000 individuals have records that can be linked across all sectors and 1.93 million have records in at least two sectors. The reason there is a high number (1.26 million) of K-12 records with no match is because more

than half of MSDE data is K-8 students – a population generally not engaged in higher education or the workforce and therefore not able to be matched to another sector.

B. Match Rate

The Center calculates match rates based on the number of 12th grade students from Maryland public schools with a record in at least another education or workforce sector. The Center’s match rate has remained at 94% over time.¹ The high match rate indicates strong data matching routines and provides confidence in the system. Table 2 provides a breakdown of the match rate for each cohort year.

Table 2. 12th Grade Cohort Cross-Sector Match Rate Analysis

Cohort Year	Total 12th Grade	K12 Only	K12 & College	K12 & Workforce	All 3 Sectors	% Matched ANY Sector	% Matched ALL 3 Sectors
2021	61,511	6,947	9,433	15,309	29,822	89%	48%
2020	62,617	5,604	6,908	15,205	34,900	91%	56%
2019	61,029	4,184	5,214	14,528	37,103	93%	61%
2018	61,808	3,580	4,286	14,179	39,763	94%	64%
2017	60,553	3,022	3,501	13,735	40,295	95%	67%
2016	60,356	2,689	3,284	12,975	41,408	96%	69%
2015	61,347	2,803	3,071	13,076	42,397	95%	69%
2014	60,483	2,488	2,931	12,153	42,911	96%	71%
2013	60,990	2,442	2,812	11,999	43,737	96%	72%
2012	60,525	2,315	2,865	11,764	43,581	96%	72%
2011	62,333	2,927	2,923	12,411	44,072	95%	71%
2010	61,962	2,630	3,015	11,682	44,635	96%	72%
2009	61,760	2,990	3,316	11,370	44,084	95%	71%
2008	65,039	5,182	5,965	11,342	42,550	92%	65%
Total	862,313	49,803	59,524	181,728	571,258		

C. Data Center Move

The MLDS Center moved its data system to the Department of Information Technology’s (DoIT) enterprise data center from the data center at the State Department of Education. The Center had to upgrade its servers, which were over 10 years old and no longer under warranty. The

¹ The match rate is an average of all years (2008 -2021). The match rate for any given year will change over time. For example, the 2021 match rate of 89% will likely increase over time as more students move into college and the workforce, or return to Maryland from an out-of-state college and join the Maryland workforce.

enterprise data center offers several advantages, including more robust physical security and seamless integration with DoIT security and backup services. The move to the new system, which was fully managed by DoIT in partnership with the Center's IT staff, was seamlessly implemented and created no downtime or work stoppage for system users. The system has increased processing speed and can easily accommodate the current system needs and future growth in data and usage.

D. Systems Security

Last year, DoIT's Office of Security Management (OSM) conducted a Security Assessment on the Center's Data System. The purpose of the assessment was to determine the Center's security maturity level and provide recommendations to identify areas of improvement to mature their overall posture. To do this OSM assessed the data system and personnel using the NIST Cybersecurity Framework (CSF), the Capabilities Maturity Model Integration (CMMI) and the DoIT Information Technology Security Manual (version 1.2).

This year, Center staff worked to implement the corrective actions and best practices recommended by the assessment. Actions taken include the implementation of a yearly review of all security policies and procedures, improvements to the staff authorization process and ongoing status reviews, and continued Oracle and webcenter upgrades and patching. Next year, staff will work to test the disaster recovery plan, update the Data Security and Safeguarding Plan, and continue to make upgrades to Oracle database systems.

In addition to changes made as a result of the security assessment, the Center also implemented changes that limit a system user's ability to remove data and documentation from the system. For research and reporting, users access the MLDS via a virtual machine. The configuration for those machines has been changed to restrict internet access. This means that system users are unable to remove data from their virtual machines and instead have to request data be sent to them by the Executive Director after a review to ensure that the data are properly suppressed. It should be noted that system users only have access to de-identified data (i.e. data that have been stripped of all personally identifiable information). This change ensures de-identified data are not removed from the system unless they are properly aggregated with small cell sizes suppressed. This further hardening of the system configuration adds another layer of security and increases compliance with security procedures and processes.

1.2 Activities of the Center

A. Stakeholder Engagement

Community Colleges

The Center completed data tables for Maryland's sixteen community colleges for the annual Performance Accountability Report (PAR). These tables report on wage visibility and earnings for community college graduates. The report was expanded this year to provide nine years of trend data on wage visibility and seven years of pre/post graduation median quarterly wages. Dr. Ann Kellogg, the Center's Director of Reporting Services, worked with the colleges on a new pilot project to report PAR by college major. The initial findings were that the college major groupings specified by the participants were still too granular and would result in extensive suppression. Staff is continuing to work with the community college representatives to provide reporting options that could be considered that would minimize the need for suppression.

The Center also completed six data requests related to the role the Associate's of Arts in Teaching (AAT) plays in the teacher pipeline, including: the pipeline of high school students who enroll in an AAT programs; the pipeline of students moving from an AAT program to a four-year degree; and the pipeline from the AAT to teaching in Maryland public schools. A summary of the analysis was presented to the AAT Council.

Colleges of Education

The Center provided data tables to Maryland's four-year institutions to support required annual reporting for the Council for the Accreditation of Educator Preparation (CAEP). These tables report on the number of students who complete teacher education programs and teach in Maryland public schools.

The Traditional Educator Preparation Report (TPAR) was completed and posted to the MLDS website² under Educator Preparation Program Reports. The posted report contains three cohort years of data. The data tables for the educator preparation accreditation report were also updated and added to the Educator Preparation Program Reports section.

Higher Education Commission and Department of Health

The Center completed a data request from the Maryland Higher Education Commission (MHEC) and the Maryland Department of Health (MDH) regarding employment outcomes of recent graduates from specific academic programs related to public health education. Of particular interest was whether or not these programs specifically led to employment in public

² <https://mldscenter.maryland.gov/CenterReports.html>

administration and/or the healthcare labor sectors. This information will be used by the two state agencies to inform future program offerings related to public health.

Department of Labor

The Center produced and provided data tables to the Department of Labor, Office of Adult Education and Literacy Services in the Division of Workforce Development & Adulting Learning. The data tables support federal reporting required by the U. S. Department of Education's Office of Career, Technical and Adult Education (OCTAE) and contribute to the National Reporting System (NRS). Specifically, the Center provided analysis to support Table 5 Core Follow-up Outcome Achievement.

Department of Juvenile Services

Dr. Angela Henneberger, Director of the Research Branch, and Dr. Bess Rose, Research Branch Statistician, conducted an initial analysis of the juvenile services data, including defining a cohort of analysis and outcomes of interest. They presented initial results to DJS staff and are continuing to work with DJS staff to help them get acquainted with the MLDS to conduct analyses for their research and reporting needs. In a second presentation to DJS and MSDE stakeholders, Ms. Erin Tinney³ presented preliminary findings linking DJS involvement, including severity of involvement, to high school and college enrollment outcomes. A discussion focused on measurement of DJS cohorts, policy implications for DJS, and how DJS can use this research in preparation for the upcoming legislative session.

Higher Education Commission and State Department of Education

The Maryland Higher Education Commission and State Department of Education hosted a series of listening sessions on the topic of *Increasing Immediate Postsecondary Enrollment*. The listening sessions were intended to help MHEC and MSDE gather feedback for a Joint Chairmen's Report on Increasing Participation in Postsecondary Education. Dr. Ann Kellogg, the MLDS Center Director of Reporting Services attended the sessions and provided an overview of the Center's dashboards on the college-going patterns of Maryland High School Graduates.

Higher Education Commission

The Research Branch conducted analyses to update two research reports at the request of MHEC. First, updated analyses were provided using propensity score analysis to rigorously examine the college and career outcomes for dually enrolled students when compared to non-dually enrolled students. Second, updated analyses were provided examining the rates of

³Ms. Tinney is a Graduate Research Assistant with the MLDS Research Branch and at the University of Maryland, College Park, Department of Criminology and Criminal Justice.

remedial course taking and the characteristics of students taking remedial coursework in Maryland community colleges.

State Department of Education

Researchers at the Maryland Assessment Research Center (MARC) at the University of Maryland, College Park, used MLDS data to research the relationship between measures of students' high school performance and college and career readiness. The study was conducted on behalf of MSDE, which will use the findings to inform their college and career readiness standards as required under the *Blueprint for Maryland's Future*.

B. Data Requests

Below is a brief synopsis of data requests the Center received this year that were fulfilled (15). There were 13 requests that could not be fulfilled. Generally, data requests are denied if the requester is seeking individual student data, data not included in the MLDS, or non-longitudinal data.⁴

1. *Department of Legislative Services* - request for the percentage of high school graduates with immediate college enrollment who continued to a second year. Information includes part-time versus full time and wage visibility.
2. *Department of Legislative Services* - request for the wages visibility for high school graduates who did not remain enrolled for a second year.
3. *Department of Legislative Services* - request for information on immediate college enrollment by high school graduates from 2014 to 2020, by sector.
4. *Department of Legislative Services* - request for the number of out-of-state students that graduate from Morgan State University and stay in Maryland immediately after graduation and for one and five years thereafter.
5. *Associate's of Arts in Teaching (AAT) Council* - request for the number of Bachelor's degree graduates, Master's degree graduates, and novice teachers with an AAT enrollment or degree.
6. *Associate's of Arts in Teaching (AAT) Council* - request for information about novice teachers including the number with a Maryland K-12 record and the number with a Maryland postsecondary record.
7. *Maryland Higher Education Commission* - request for workforce outcomes for graduates in certain Maryland postsecondary public health programs.
8. *Towson University* - request for the number of Towson University's bachelor's degree recipients that are employed in Maryland after graduating and their average earnings.

⁴ COMAR 14.36.04.07 requires the Center to deny a request for a non-longitudinal data set. A data set is non-longitudinal if it contains data provided by a single State agency. A non-longitudinal data set must be referred to the appropriate agency.

9. *Harford County Community College* - request for information on Harford County K12 graduates that do not enroll in Harford County Community College (HCCC). HCCC is interested in understanding whether Harford County K12 graduates are going elsewhere because a course of study is not offered at HCCC. This request was developed for all community colleges and posted on the MLDS website.
10. *Maryland State Department of Education* - requested information on teachers in the staffing file who went to a Maryland high school or college, including information on whether they have a bachelor's degree and their major.
11. *Department of Legislative Services* - requested an update of #1 above.
12. *Department of Legislative Services* - requested an update of #2 above.
13. *Department of Legislative Services* - requested an update of #3 above.
14. *Frederick County Community College* - requested earnings and employment outcomes in support of their application for an Aspen Institute Community College Prize for Excellence.
15. *Harford County Community College* - requested earnings and employment outcomes in support of their application for an Aspen Institute Community College Prize for Excellence.

C. Research Series

The MLDS Center Research Branch hosts a virtual brown bag forum to bring together researchers, policy-makers, and practitioners to discuss in-progress research on academic and workforce outcomes. The forum, which meets monthly during the fall and spring semesters, focuses on research that is being conducted using the MLDS or topics of interest to the Center and its stakeholders. A link to the presentation slides is available on the MLDS website.⁵

1. Topic: Teacher and Peer Characteristics in Maryland Public Schools: Changes Over Time and Links to College and Career Outcomes (March 2022)

This presentation, by Dr. David Blazar and Mr. Francisco Lagos,⁶ examines changes in teacher and student characteristics in Maryland over the last decade, implications of these changes for the measurement of teacher and student/peer characteristics, and links to longitudinal student outcomes. The presentation includes two related analyses: one focused on teachers and the other on students/peers. For teachers, we examine shifts in the Maryland teacher labor force since the Great Recession, focusing in particular on career and technical education teachers (CTE) whose industry experience may make them more likely to be susceptible to alternative

⁵ <https://mldscenter.maryland.gov/ResearchSeries.html>

⁶ Dr. David Blazar is an Associate Professor in Education Policy and Leadership at the University of Maryland College Park, and a member of the MLDS Center research branch. Mr. Francisco Lagos is a graduate research assistant with the MLDS Center and a Ph.D. candidate at the University of Maryland College Park.

labor market options. We also examine who teaches CTE classes, finding that teachers without specific CTE credentials often take on this role. For students, we examine how within-school changes in student demographics and peer diversity over time relate to changes in short- and long-term outcomes, including college and career outcomes, as well as how these relationships change depending on the operationalization of peer characteristics and diversity. Preliminary results show that discrete changes in school diversity (rather than linear increments of diversity or concentration of same race/ethnicity peers) are associated with college and career benefits for students.

2. Morgan State University Research Branch Partners - Research Interests and Future Directions (April 2022)

Drs. Omari Jackson and Rhonda Baylor are faculty members and researchers at the School of Education and Urban Studies at Morgan State University.⁷ As new members of the MLDS Center Research Branch, they provided an overview of their current research and how that research will inform their work with Center data.

Dr. Omari Jackson discussed his past research entitled: “A Generation Out of Apartheid: Intergenerational Educational Experiences among the South African Black Middle Class.” South African Apartheid restricted social and economic mobility among blacks. With the abolition of Apartheid, in 1994, a black middle class was actualized. This project offers insight into the role Apartheid played in parents’ mobility. Furthermore, it explains how parents’ upward mobility impacts the lives of their children. Ultimately, children have broader aspirations than their parents. However, despite progress, the black middle class continues to face barriers. This presentation will also cover similarities and differences between the South African and U.S. black middle classes, and will highlight potential directions for future research with MLDS data.

Dr. Rhonda Baylor discussed her research entitled: “Geographic Information System (GIS) Research with Open Baltimore.” This presentation demonstrated how to conduct geographic information system (GIS) research using Open Baltimore, a repository of datasets published by the city to enhance transparency. More specifically, Dr. Baylor demonstrated how to build GIS maps and how to interpret those GIS maps using various Baltimore City education datasets that are included in the system and will highlight potential directions for future research using GIS with MLDS data.

⁷ Dr. Omari Jackson, is an Associate Director of Research for the MLDS Center and an Associate Professor of Urban Educational Leadership. Dr. Rhonda Erica Baylor is an investigator with the MLDS Center, an educational psychologist, and an assistant professor at Morgan State University.

3. Applications of Data Science Methods to MLDS Data (May 2022)

Dr. Tracy Sweet's⁸ presentation on data science, introduced several data science algorithms and discussed how they can be used to inform MLDS research. For example, standardized test scores are a key predictor of college and career readiness, but researchers are grappling with the problem of missing test scores because standardized tests were not administered in 2020 or 2021 during the COVID-19 pandemic. As a result, MLDS researchers will not be able to use test scores from these two years in models to predict postsecondary and workforce outcomes (e.g. college enrollment, degree attainment, wages). Data science methods can be applied to predict standardized test scores with the primary goal of examining the effects of these predicted scores on postsecondary outcomes (e.g. are these scores as predictive as actual test scores for predicting college enrollment, degree attainment, and wages)? Future directions for use of these algorithms will be discussed, including their potential limitations with nested data structures and predictions for specific student subgroups (e.g., English Language Learners, students who are eligible for free/reduced price meals). Additional future applications of data science methods to evaluate educational policies in Maryland will also be discussed.

4. Public High School Music Education in Maryland: Exploring Equity and Postsecondary Outcomes (September 2022)

In this presentation, Dr. Kenneth Elpus and Mr. David Miller⁹ discussed their two studies that used MLDS data to examine the student, teacher, and school characteristics associated with public high school music education in Maryland and the postsecondary outcomes for music students. The presentation reviewed the demographic composition of music students and music teachers, comparing their characteristics to non-music students and teachers and comparing postsecondary attendance between music students and non-music students. The research leveraged the elective nature of Arts courses in the highly prescriptive International Baccalaureate Diploma Program (IBDP) to compare (through a propensity score model) post secondary admissions outcomes for IBDP students who did and did not elect arts education. This research was part of an U.S. Department of Education, Institute of Education Sciences grant funded project exploring the relationship between rigorous, high quality arts education in high school and the successful transition to postsecondary schooling. Policy implications for music/arts education and the postsecondary transition in Maryland were discussed.

⁸ Dr. Tracy Sweet is Associate Director of Research with the MLDS Center and is Associate Professor in the Measurement, Statistics and Evaluation program in the Department of Human Development and Quantitative Methodology at the University of Maryland.

⁹ Dr. Kenneth Elpus is Professor of Music Education and Associate Director of the University of Maryland School of Music. He is principal investigator of the Music & Arts Education Data Lab, the University of Maryland's National Endowment for the Arts Research Lab. Mr. David Miller is a graduate teaching assistant and Ph.D. candidate at the University of Maryland College Park and is a graduate research assistant with the MLDS Center.

5. A Multilevel Study of Student and School Characteristics Related to School Transfer, High School Graduation, and College Enrollment (October 2022)

Dr. Dante De Tablan¹⁰ presented his dissertation research project which analyzed student transfers during high school and the relationship between transfer and postsecondary outcomes. This study used data from the MLDS to investigate transfer risk among a cohort of 6,810 first-time ninth grade students in Baltimore City Public Schools from 2012-13 to 2017-18. Additionally, this study examined student and school characteristics associated with four-year high school graduation and college enrollment. The findings revealed student- and school-level characteristics associated with lower and higher risks for transferring schools in high school. In addition, critical student and school factors related to the odds of high school graduation and college enrollment. The presentation focused on the research, policy, and practice implications stemming from this study. Upstream and downstream interventions were addressed, including the Full-Service Community Schools strategy, a vital component of the Blueprint for Maryland's Future.

6. Overview and Evaluation of an Early Warning Indicator and Intervention System to Keep Ninth-Grade Students On-Track to High School Graduation in a South-Eastern State (December 2022)

This project did not use MLDS data but was selected to inform future MLDS research on early warning indicator systems. The presenters, Dr. Marcia Davis and Dr. Martha Maclver,¹¹ are from the Center for Social Organization of Schools (CSOS), which has worked with schools and LEAs that serve high poverty student populations. CSOS designs and implements early warning and intervention systems (EWS) to increase high school graduation rates and post-secondary success. Drs. Davis and Maclver, CSOS faculty members, reviewed process and outcome evaluation findings from an Institute of Education Sciences funded study on EWS effectiveness. First, Dr. Marcia Davis presented data on the implementation of the EWS and associations between implementation and ninth grade student outcomes. Second, Dr. Martha Maclver presented an efficacy study of the EWS on ninth-grade student outcomes. Results from these studies showed that higher levels of implementation of early warning and intervention components in the treatment schools were associated with improved levels of ninth-grade student achievement and attendance outcomes and students in the EWS treatment schools were significantly less likely than control school students to be chronically absent. The

¹⁰ Dr. Dante de Tablan is a member of the research branch of the MLDS Center and an affiliate with the University of Maryland School of Social Work.

¹¹ Marcia Davis, PhD, is a director of CSOS and an Associate Professor in the School of Education at Johns Hopkins University. Martha Abele Maclver, PhD, is an Associate Research Professor at CSOS at the Johns Hopkins University School of Education.

presentation included a discussion focused on the policy implications of this research and the importance of longitudinal data systems for linking early warning indicators to outcomes.

D. Presentations

SLDS Webinar

Drs. Henneberger and Uretsky were invited to present MLDS research at the State Longitudinal Data Systems (SLDS) Webinar on *Understanding, Measuring, and Predicting P20W+ Outcomes*. They discussed how Maryland identifies persisting students--who are still enrolled, but have not earned a diploma on their expected graduation date--including examining the unique demographic, academic, and behavioral characteristics and the college and career outcomes for these students.

Maryland Equity Project

Dr. Henneberger presented MLDS research at the University of Maryland College Park Maryland Equity Project colloquium. Her presentation focused on the relationship between student homelessness and academic and career outcomes to better inform the provision of services to improve outcomes for homeless students.

Johns Hopkins University

Drs. Henneberger and Rose presented MLDS research projects to a group of graduate students at the Johns Hopkins University. The discussion focused on policies, procedures, and research analyses that can help to inform policy. This forum at Johns Hopkins has the goal of helping students to better understand researcher-practitioner and policy partnerships in the State.

American Educational Research Association

Dr. Uretsky presented MLDS research at the annual convening of the American Educational Research Association (AERA), a national research society that strives to improve educational research and outcomes. The presentation focused on how Maryland identifies persisting students (students who are still enrolled, but have not earned a diploma on their expected graduation date), including examining the unique demographic, academic, and behavioral characteristics and college and career outcomes for these students and how they compare to dropouts.

Society for Social Work Research

Dr. Dawnsha Mushonga¹² presented research on the longer-term outcomes of students experiencing homelessness at the Society for Social Work Research annual conference. This study leveraged MLDS data to investigate the association between homelessness and educational and early labor market outcomes, above and beyond the associations linked to disadvantage. Educational outcomes were worse for homeless students than students who experienced disadvantage alone; however, no significant differences were observed in early labor market outcomes, although racial differences were detected. This study underscores the importance of targeted interventions in promoting positive, long-term outcomes, particularly for students who were homeless in adolescence.

Association for Education Finance and Policy

MLDS data were used for two presentations for the Association for Education Finance and Policy (AEFP). First, Dr. David Blazar used MLDS data to examine changes in teacher demographic characteristics in Maryland over time. Specifically, the analysis examined shifts in the Maryland teacher labor force since the Great Recession, focusing in particular on career and technical education teachers (CTE) whose industry experience may make them more likely to be susceptible to alternative labor market options. Dr. Blazar also examined the background of teachers who are teaching CTE classes, finding that teachers without specific CTE credentials often take on this role. Second, Mr. Logos used MLDS data and examined how within-school changes in student demographics and peer diversity over time relate to changes in short- and long-term outcomes, including college and career outcomes. This research also examined how the relationship between peer diversity and long-term outcomes changed when using different measures of peer characteristics and diversity. Discrete changes in school diversity (rather than linear increments of diversity or concentration of same race/ethnicity peers) are associated with college and career benefits for students.

American Society of Criminology (ASC)

Ms. Erin Tinney presented MLDS research at ASC in November of 2022. The project focuses on the academic, behavioral, and college enrollment outcomes for youth who were justice involved. Preliminary results indicate: (1) students who are justice-involved are less likely to graduate from school on time and enroll in postsecondary education, and are more likely to be suspended or expelled than students who are not justice involved; (2) the worst impacts are felt by those who experience greater levels of involvement, though the difference between students who are arrested and who are adjudicated is small; and (3) outcomes are worse for those under residential placement, suggesting that perhaps separation from school is an important factor in

¹² Dr. Dawnsha Mushonga is a MLDS Research Branch member and an Assistant Professor in Human Services Administration at the University of Baltimore

completing one's education. Next steps include examining whether the impacts of justice system involvement were due to school absence or other factors and examining the moderating roles of gender, race, and the COVID-19 pandemic.

AERA-NSF Grants Fall Conference

Dr. Angela Henneberger and Dr. Laura Stapleton¹³ were invited to present at the Fall research conference meeting of the AERA-NSF Grants Awardees. The presentation will focus on the research partnership between the MLDS Center and the universities. Research findings will be highlighted to help awardees better understand the use of state longitudinal data to engage in research that helps to inform state and local policy.

Data Foundations Conference

Dr. Uretsky also presented his research *Identifying Persisters as a Unique Subgroup of Students in Maryland* at the 2022 virtual meeting of the Data Foundations Conference. The Data Foundation's 2022 Virtual Research Symposium, in partnership with George Washington University's Trachtenberg School for Public Policy and Public Administration, provides the opportunity for researchers, data analysts, evaluators, program managers, and other experts from across the data and evidence community to share knowledge and innovative practices.

E. Census Data

Pursuant to Education Article §24–703.3, Annotated Code of Maryland, the MLDS Center is required to develop a protocol for geocoding K-12 student data. Geolocation data on students will allow the Center to associate each student within a Census block and tract and utilize detailed demographic information about the Census block and tract contained in the American Community Survey produced by the U.S. Census Bureau. This will provide policymakers with more in-depth information on students' socioeconomic status. The MLDS Center is required to develop a protocol for local education agencies (LEAs) to convert a student's home address and geolocation information into Census tract and block numbers.

The project, which began in 2021, continued this year, including additional meetings with the Census Tract and Block Data Workgroup (which includes MSDE, MLDS Center, and LEA representatives). The Workgroup reviewed the implementation timeline and discussed ways to communicate with LEAs. One of the key components of the project was for the MLDS Center to develop a utility for the LEAs to use to convert student addresses to a Census block and tract geocode. That utility was developed internally and implemented this year. MLDS Center staff

¹³Dr. Laura M. Stapleton is chair of the Department of Human Development and Quantitative Methodology and a professor of Measurement, Statistics and Evaluation.

provided a manual, training webinars, and on-demand technical assistance as LEAs began utilizing the utility.

MSDE provided LEAs with a data collection manual on September 28, 2022. The 2022-2023 data collection opened on October 3, 2022 and closed on November 11, 2022. Additionally, MSDE had a report due to the General Assembly, Accountability and Implementation Board (AIB), and the Department of Budget and Management by December 1, 2022. The report detailed the data collection process necessary, including the use of the MLDS Center utility, to implement the MSDE recommended poverty indicator methodology.

Overall, almost 97% of enrolled students had an address converted into Census tract and block numbers. LEAs indicated there were challenges converting addresses in apartment complexes and mobile home parks. The MLDS Center will work to update the utility to support converting addresses from these areas. The MLDS Center will also work to improve the methodology for identifying the highest strength match rating when more than one matched address is identified.

F. Workforce Data Quality Initiative Grant Update

Last year, the Maryland Department of Labor, Division of Workforce Development and Adult Education received a Workforce Data Quality Initiative (WDQI) Grant from the U.S. Department of Labor. The WDQI project is a collaboration between Labor, the MLDS Center and MHEC. The grant was awarded for approximately two million dollars over a period of three years. The scope of the project is to expand the capacity and utility of the MLDS by integrating additional workforce development data into the system, including Enrollment and performance data from:

1. Workforce Innovation and Opportunity Act (WIOA) Title I: Adult, Dislocated Worker, and Youth;
2. WIOA Title III: Employment Services; and
3. MHEC's community college non-credit training programs.

Incorporating this additional workforce and non-credit education data will allow MLDS to review Maryland's comprehensive workforce development system, leading to a more meaningful and in-depth analysis of the successes and challenges facing Maryland job seekers and businesses. Specifically, it will provide the capacity to house workforce and education data, as well as community college non-credit occupational training data, within the same database. Richer data will provide policymakers with a deeper understanding of the relationship between higher education and workforce development, as well as better information regarding employment outcomes tied to community college training completers. Project research efforts will focus on the inclusion of underserved and target populations within Maryland's workforce system. The

Department of Labor will partner with Salisbury University as the research entity for this initiative. The project will accomplish the following:

1. Connect the workforce, unemployment, and education data contained in the MLDS;
2. Improve the quality and breadth of the data in the MLDS, including standardization of MHEC's non-credit data;
3. Use longitudinal data to assess the performance of Maryland's education and job training programs;
4. Provide user-friendly information and data on how the Maryland workforce system is collectively serving customers through the lens of the Benchmarks of Success; and
5. Integrate performance systems with the longitudinal administrative database.

This year, the Center procured a services contract that provides a business analyst and data analyst to work with and integrate the new data into the MLDS.

G. Conferences

State Higher Education Executive Officers Association's (SHEEO) convening on Aligning K-12 and Postsecondary Education

An MLDS Center team was selected to participate in the State Higher Education Executive Officers Association's (SHEEO) Community of Practice convening on *Aligning K-12 and Postsecondary Education*. The convenings support cross-state networking to share ideas and strategies for working with data. Maryland's interest focused on the need to develop processes for linking social determinants data from the Department of Juvenile Services (DJS) and the Department of Human Services with existing administrative data from education and workforce data sharing partners. Guest speakers and panelists from several states shared their experiences on using data to study equity issues, develop research agendas and other topics of interest to Maryland. Each day had dedicated team time allowing the Maryland contingent to collaborate on goals, obstacles, and data governance issues.

Multi-State Data Collaboratives: From Project to Products to Practice

Dr. Kellogg participated in a panel session on March 30th at the nationwide two-day Coleridge Initiative convening. Dr. Kellogg was joined by representatives from the states of Ohio, Arkansas, and California in the panel session, entitled *Evolving Products to Practice: Training and Networks*. Panelists discussed how participating in the Coleridge Initiative's Applied Data Analytics program helped shape work within each panelist's state and how it fostered relationships with other states.

Academic Conferences

Dr. Henneberger attended the annual meeting of the Society for Prevention Research. This year's virtual program focused on centering equity in multi-sectoral data evaluations, dissemination, and implementation. Additionally, she attended two equity trainings, one hosted by the UMB School of Social Work and one hosted by the National Academies of Science, Engineering, and Math. These trainings will help with infusing equity principles into the research agenda and the research analyses conducted by the MLDS research branch.

H. Exploring Data Sharing Partnership with the Division of Correction

During the 2022 session of the Maryland General Assembly, SB 277/ HB 127 - *Maryland Longitudinal Data System Center - Division of Correction - Data Requirement* was introduced but did not pass. The bill would have required the Division of Correction (DOC) within the Department of Public Safety and Correctional Services to provide records and other information related to current and former Maryland inmates to the Maryland Longitudinal Data System (MLDS) Center. The bill would have also required the MLDS Center to collect and maintain that information and add to its research and reporting responsibilities, including research on the impact of prison-based education or training programs (including work release or other transition programs) on workforce outcomes and future recidivism. Discussions between the MLDS Center, the Division of Correction, and the sponsor of the bill during the legislative session resulted in an agreement to table the bill, with the understanding that a legislative requirement was not necessary for the Division of Correction to share data with the MLDS Center. (A legislative change was necessary for MLDS Center to receive corrections data - which was accomplished through an amendment to SB 763 (Chapter 141) - *Public Safety and Criminal Procedure - Collection, Reporting, and Publication of Criminal Case and Prosecutorial Information*. The bill removed the restriction in Ed. Art. § 24-701 against the MLDS Center having criminal history data.)

The MLDS Center and the Division of Correction have been working collaboratively on a Data Sharing agreement and on developing an understanding on data to be included in the MLDS to answer important policy questions facing the state.

I. Commission to Study the Health Care Workforce Crisis in Maryland

In 2022, SB 440 (Chapter 708) - *Commission to Study the Health Care Workforce Crisis in Maryland - Establishment* was enacted. The Executive Director of the MLDS Center was appointed to serve on the Commission. The MLDS Center's data sharing partnerships, including those being established between the MLDS Center and the health occupation boards and commissions, can provide valuable information to the Commission. For example, one provision requires the Commission to examine turnover rates and average rate of tenure. The MLDS

Center can provide information relevant to that question, such as the percentage of new licensees working in a health care industry within a certain amount of time and the percentage of licensees still working in a healthcare industry (and/or for the same employer) within a certain amount of time. The Center can also contribute information to questions concerning the state educational institutions and how effectively they are feeding the health occupations pipeline.

Center staff have been participating in the Commission meetings and the various work groups established to address the questions posed in the enabling legislation. In addition, staff have been working to finalize data sharing agreements with the health occupations boards and commissions and identify data elements to be included in the MLDS to help analyze the various issues facing the Health Care Workforce Crisis Commission.

J. AIB Blueprint Teacher Prep Workgroup

Mr. Ross Goldstein, Ms. Molly Abend, and Dr. Ann Kellogg attended the first meeting of the Accountability Implementation Board (AIB) Blueprint Teacher Prep workgroup on August 12th. MLDS staff have been invited to participate in the workgroup to provide data and analysis to the group when needed. The first meeting focused on introductions and initiated discussion around potential challenges institutions may have with implementing changes to educator preparation programs outlined in the Blueprint.

K. MicroSoft Certification Data

Dr. Megean Garvin, MLDS Research Branch Member and Director of Research and Assessment, Maryland Center for Computing Education led the effort to establish a data sharing agreement with Microsoft for their certification testing results for Maryland students. A data agreement was entered into, data elements were identified, and, with the approval of the Governing Board, the data elements were added to the MLDS Data Inventory. These data represent the first data collection from a non-State agency and will be used to help understand STEM workforce pathways.

L. Research Agenda Revision

Staff of the Center have been working on a comprehensive revision of the Research Agenda¹⁴ to propose to the Board for approval. The Governing Board directed staff to undertake a comprehensive revision, noting in the 2021 Annual Report that:

¹⁴ <https://mldscenter.maryland.gov/ResearchAgenda.html>

The MLDS Center’s Research Agenda was developed by the Governor’s P20W Development Council over 10 years ago. While minor changes have been made, there has not been a comprehensive review of the Research Agenda, such as:

- 1. What purpose should the Research Agenda serve;*
- 2. Are the current questions/topics sufficient to address the Center’s added scope of work as a result of legislative changes and new data sources; and*
- 3. How can the agenda address questions of social equity?*

Accordingly the Governing Board directs the MLDS Center staff, in consultation with Governing Board designees and other stakeholders, to undertake a comprehensive review of the current Research Agenda and provide conclusions and any proposed changes for the Board’s consideration later next year.

Staff have reviewed other state research agendas, reviewed the current research agenda with individuals familiar with its development, received feedback from stakeholders and generated a set of guiding principles for what should be included in the revised agenda. A final proposal for the Board’s consideration will be completed in March 2023.

M. Published Research

The MLDS Center Research Branch members had four research papers published in prestigious academic journals.

1. Henneberger, A.K., Rose, B.A., Mushonga, D.R., Nam, B., & Preston, A.M. (in press). Expanding the understanding of school concentrated disadvantage using free and reduced-price meals data: Links to college and labor market outcomes in Maryland. *Journal of Education for Students Placed at Risk*.
2. Mushonga, D.R., Uretsky, M.C., Rose, B.A., & Henneberger, A.K. (in press). Linking homelessness in secondary school to postsecondary and early labor market outcomes in Maryland using a continuum of risk framework. *Applied Developmental Science*.
3. Uretsky, M.C. & Henneberger, A.K. (in press). Expanding the understanding of high school nongraduates through a comparison of high school dropouts and persisters. *Journal of Education for Students Placed at Risk*.
4. Uretsky, M.C. & Henneberger, A.K. (2022). Supporting late graduates, GED earners, and noncompleters through the transition into postsecondary and the labor market. *Preventing School Failure*.

N. Grant Funding

In fiscal year 2022, the MLDS Center applied for or supported seven projects seeking grant funding. Two of those projects were awarded \$3.1 million in funding. These grant funded

projects produce high quality research on topics of interest and importance to Maryland stakeholders at no additional cost to the State.

This year, the MLDS Research Branch (Dr. Lincove at UMBC, Dr. Blazar at UMCP, and Dr. Henneberger at UMB) partnered with MHEC and MSDE to submit an application to the U.S. Department of Education, Institute of Education Sciences for their Using Longitudinal Data to Support State Policymaking grant competition. The grant is for \$1 million over three years. The project, entitled *Using Maryland's SLDS To Strengthen And Diversify The Teacher Workforce Through High School To Career Pathways*, proposes using MLDS data to inform state and local strategies and decisions regarding expanding and diversifying the teacher pipeline. Specifically, the proposed project will focus on several existing pathways for Maryland high school graduates to enter teaching including dual enrollment, community college, and four-year pathways. This project will examine points of exit for high school graduates who pursue teacher education to help policymakers identify and remove barriers to completion. Additionally, the proposed project will examine the current teacher workforce to find the most common pathways into teaching for teachers of color who are successful and persistent in long-term employment in public school. The objective is to use the MLDS to provide policymakers and stakeholders with a comprehensive and detailed understanding of where the existing teacher workforce came from, the potential expansions in the teacher pipeline, and common points of leakage or blockage where potential teachers exit that pipeline.

The proposed project will provide important insights for state policy makers to consider while grappling with teacher shortages. It will also directly inform the Center's reporting to the Accountability and Implementation Board on issues surrounding teacher preparation, retention, and diversity.

Section 2. List of All Studies Performed by the Center

2.1 Research

A. Applying Data Science Methods to Inform Maryland Policy

Dr. Tracy Sweet¹⁵ and several graduate students have worked with stakeholders to develop research questions related to higher education credit attainment and missing test scores due to the COVID-19 pandemic. The team will apply data science methods and compare them to traditional methods, assess their performance for multilevel data, and determine their reliability

¹⁵Dr. Sweet is an Associate Director of Research with the MLDS Center and Associate Professor in the Measurement, Statistics and Evaluation program in the Department of Human Development and Quantitative Methodology, College of Education at the University of Maryland.

when applied to analyses across student subgroups (e.g., race/ethnicity; FARMs; ELL; special education).

B. Justice-Involved Students

Dr. Wade Jacobsen¹⁶ and graduate student Ms. Erin Tinney have been examining whether justice-involved students experience worse academic outcomes than students who never experienced contact with the justice system or students who have had contact with the justice system but were never placed in a Department of Juvenile Services (DJS) facility. Additionally, they are examining whether justice-involved students have different high school experiences (graduation and exclusionary discipline), postsecondary education outcomes, and workforce outcomes than students who experienced longer-term absences from Maryland public K-12 schools for other reasons. This line of inquiry will also explore whether relationships vary by student race, ethnicity, and gender.

C. Public School Suspensions

Dr. Jane Lincove¹⁷ is examining behavior and academic outcomes of the 2017 K-2 suspension ban policy in Maryland. The team is using difference-in-difference models to compare outcomes (suspensions, attendance, grade 3 test scores) at schools that had high versus null levels of kindergarten suspension rates before the ban and will determine the effects after the ban. Studies in other states suggest that one outcome of suspension bans is that schools are more likely to create IEPs for students with behavior problems. Next steps include looking at special education designations in the MLDS data.

Dr. Lincove and team are also addressing additional questions posed by MSDE:

1. What was the effect of the K-2 suspension ban on student discipline measures in K-2?
2. Are there school-wide spillover effects in upper elementary, including effects on 3rd grade exams?
3. Did the ban reduce disparities by race/ses? and
4. Did the ban reduce future discipline outcomes for students who were suspended prior to the ban?

The researchers provided a presentation of their findings for MSDE.

¹⁶ Dr. Wade Jacobsen is an Assistant Professor in the Department of Criminology and Criminal Justice at the University of Maryland and a Faculty Associate at the Maryland Population Research Center. He is an investigator with the MLDS Center. Ms. Erin Tinney is a graduate student researcher with the MLDS Center.

¹⁷ Dr. Jane Lincove is an Investigator with the MLDS Center and is Professor of Public Policy at UMBC. She is also a Research Fellow at the Education Research Alliance for New Orleans at Tulane University.

D. Dual Enrollment

Dr. Miriam Wigglesworth¹⁸ has completed a set of results that will help to advance the MLDS Center's knowledge on dual enrollment. She is using the population of students who were enrolled in both a K-12 public school and an institution of higher education who also have course enrollment information from MSDE. Her results examined course passing rates overall and by cohort year, gender, race/ethnicity, local school system, and free/reduced price meals eligibility. Additionally, she examined the type of college attended, including whether or not students attended the same college as the dual enrollment college, after high school. These results will be used for the MLDS Center's website content on dual enrollment. She also presented her findings to stakeholder groups at Harford Community College: (i) administrative leadership; and (ii) college-wide Dual Enrollment task force.

E. Comptroller Data Analysis

The MLDS Center has two potential sources of data that indicate that an individual is engaged in the workforce: wage data from Unemployment Insurance (UI) data; and income data from tax filings received by the Comptroller. The Research Branch has been working to understand, for a cohort of students graduating in 2017-18, whether Comptroller income data and Labor UI data differ by key demographic characteristics. Thus far, findings indicate that there are observable differences by student demographic characteristics and local school system, meaning that there was variation in:

- a. The visibility of students in Labor UI data by demographics and LSS; and
- b. The percentage of students who were not visible in UI wage data that were found in MD Comptroller data.

Next steps include looking at differences by student homelessness and looking at aggregate earnings amounts in UI data compared to the Comptroller data.

F. Teacher Diversity

Under the guidance of Dr. David Blazar¹⁹ and Dr. Jing Liu²⁰, a team of researchers are working on analyses for several topics including:

- a. Recruitment strategies aimed at diversifying the teacher workforce (grant-funded by the Institute of Education Science, U.S. Department of Education); and
- b. Characteristics of STEM-CTE teachers (grant-funded by the National Science Foundation).

¹⁸Dr. Wigglesworth is an Associate Professor of Business Management at Harford Community College and is a recent Ph.D. recipient from Wilmington University in Delaware. Dr. Wigglesworth's research for the Center was developed into her dissertation.

¹⁹ Dr. David Blazar is an Investigator with the MLDS Center and is Associate Professor of Education Policy and Economics at the University of Maryland, College of Education.

²⁰ Dr. Jing Liu is an Investigator with the MLDS Center and is Assistant Professor of Education Policy and Economics at the University of Maryland.

The researchers have conducted data cleaning to build analytic files that link K-12 student enrollments, K-12 course enrollment, teacher characteristics, and high school and college outcomes. The researchers have also conducted exploratory analyses of enrollment/take-up trends by county and year. For the teacher diversity topic, the researchers continued descriptive analyses on the relationship between Teacher Academy of Maryland (TAM)²¹ participation and outcomes in college and the workforce. For the CTE project, the team conducted regression analyses linking characteristics of CTE teachers to student outcomes (e.g. course grade, future advanced course taking, earning a CTE certificate, and high school graduation).

In addition to the above work on the topic of teacher diversity, the MLDS Research Branch partnered with MHEC and MSDE to submit a grant application to the Institute of Education Sciences (IES), U.S. Department of Education. The proposed project, which is seeking \$1 million over three years, would conduct research to inform state and local strategies and decisions regarding expanding and diversifying the teacher pipeline. Specifically, the proposed project will focus on several existing pathways for Maryland high school graduates to enter teaching, including: dual enrollment, community college, and four-year pathways. This project will examine points of exit for high school graduates who pursue teacher education to help policymakers identify and remove barriers to completion. Additionally, the project will examine the current teacher workforce to find the most common pathways into teaching for teachers of color who are successful and persistent in long-term employment in public schools. The objective is to use the MLDS to provide policymakers and stakeholders with a comprehensive and detailed understanding of where the existing teacher workforce came from, the potential teacher pipeline, and common points of leakage or blockage where potential teachers exit that pipeline.

G. Chronic Teacher Attrition

Ms. Erin Janulis, a graduate student working under the supervision of Dr. David Blazar, is working on a project examining chronic teacher attrition in Maryland. Her research questions focus on the characteristics of schools with chronic teacher attrition and the outcomes of students who attend schools with chronic teacher attrition. She will also examine how chronic teacher attrition relates to the retention of new teachers hired in the school. She has completed preliminary descriptive statistics examining attrition rates over time and the distribution of attrition across schools in the state.

²¹ The Teacher Academy of Maryland (TAM) is a CTE program that introduces students to the teaching profession and gives them a jump start on college coursework.

H. High School Grade Retention

Ms. Taylor Delaney, also a graduate student working with Dr. David Blazar, is working on several analyses to examine grade retention in high school. Grade retention means a student has failed to advance to the next grade in school (i.e. freshman to sophomore). She is examining several questions, including how rates of grade retention change over time and by grade-level; and how retention in high school impacts high school completion and college and workforce outcomes. Ms. Delaney has finished data cleaning and has created a data file that links K-12 student enrollments, K-12 school-level information, K-12 course-taking records, K-12 achievement records, and college-going and attainment and workforce information. She has conducted descriptive analyses of retention rates by year, grade, and LEA, as well as initial results that examine the impact of grade retention on high school completion using linear probability models and propensity score matching.

I. Computer Science Education

Dr. Megean Garvin, researcher with the MLDS Center and Research Director of the Maryland Center for Computing Education, was awarded a National Science Foundation grant to examine long standing inequities in access to and participation in computer science (CS) education. The project will help conceptualize broadening participation in computing along the K-16 pathway in a way that supports students, particularly Black women, in applying computing skills and knowledge in postsecondary and the workforce.

Dr. Megean Garvin is also working on a paper for publication in an education policy journal discussing a set of dashboards²² she developed in partnership with the MLDS Center. Specifically, the dashboards were developed for the purpose of increasing data transparency and accountability towards compliance with the state education policy. The dashboards track student computer education access and involvement from high school through higher education and workforce. The paper provides an in-depth case study with insights into how the critical data-driven dashboards were designed with stakeholders. Lessons learned include how data dashboards need to be situated into a more comprehensive policy accountability portfolio and how multiple levels of accountability are needed for full compliance. The results will assist other states that are enacting state computing education policies and attempting to longitudinally follow the evolution of the impact of that policy within critical data-driven dashboards.

²² The dashboards can be found on the MLDS Center website:
<https://mldscenter.maryland.gov/ComputerscienceDashboard.html>

J. Baltimore City - Launching Into Adulthood

In 2018, the Baltimore Education Research Consortium (BERC) completed a research project entitled, *Launching into Adulthood*. The project was funded and conducted in collaboration with Baltimore's Promise.²³ The goals of that project were to document the post-high school graduation destinations of several consecutive Baltimore City Schools graduating cohorts, chart the 6-year pathways of the oldest cohort (class of 2009), and examine variation in outcomes by student characteristics. BERC will leverage the prior research and analysis to complete an updated report that uses additional cohorts of students and examines additional comparisons, including gender, race/ethnicity, and local school system.

K. Promise Neighborhoods

The research branch worked with the Promise Neighborhoods²⁴ staff to understand their needs for federal reporting as part of their United States Department of Education grant. The team compiled and analyzed data to look at the rates of Promise Neighborhoods students graduating from high school and attending 2-year and 4-year colleges. This project builds on prior data requests fulfilled by the MLDS Center.

L. Student Transfer

Dr. Dante De Tablan completed a project examining the student and school characteristics that are associated with school transfers after entering the 9th grade and the extent to which those school transfers relate to graduation, college entry, and workforce. He further explored the timing of measures including transfer, demographic characteristics, test scores, and absences. He also explored multilevel models to examine relationships between timing of school transfer and academic outcomes, including high school graduation and college enrollment. This research was subsequently used as part of his dissertation at the University of Maryland, School of Social Work.

M. Music Education and Teaching

Dr. Ken Elpus conducted analyses to examine equity in access and uptake in music education in public high schools and the relationship with college enrollments. A combination of descriptive statistics, chi-squared analyses, and multilevel logistic regression was used to examine the research questions. Preliminary analyses indicate that access to music courses differed by several school and local school system factors and student uptake in music courses was associated with student, teacher, and school factors. Next steps include linking to postsecondary enrollment outcomes.

Mr. David Miller analyzed descriptive statistics to examine two key facets of addressing the

²³ <https://www.baltimorespromise.org/>

²⁴ The Promise Heights initiative was established in 2009 by the University of Maryland School of Social Work to improve educational outcomes for youth and ensure families are healthy and successful in the West Baltimore communities of Upton/Druid Heights.

arts/music teacher shortage: the transition of postsecondary graduates with music education degrees into the music teacher workforce and the retention of early-career music teachers (those with less than five years of experience). Next steps include using descriptive and inferential statistics to explore relationships within the MLDS data. He will also estimate the impact of COVID-19 on both relationships by leveraging a single group Interrupted Time Series design to assess the extent to which the music teacher shortage may evolve moving forward.

N. Workforce Outcomes

Dr. Mathew Uretsky continues his research project initially funded by the Institute for Research on Poverty. This project focuses on (i) identifying subgroups of students that can be identified by examining the complex patterns of student academic participation, performance, and Maryland workforce participation during the first four years of high school; (ii) identifying student characteristics associated with these subgroups, including high school graduates, diploma via GED earners, and non-graduates; and (iii) examining associations with academic and workforce outcomes in Maryland. The team is currently identifying a cohort for analyses and creating an analytic data file. Next steps include identifying the best analyses to answer the research questions of interest.

O. Positive Behavioral Intervention and Supports (PBIS)

Dr. Henneberger was awarded a grant to link data from a randomized controlled trial of the PBIS intervention framework with data from the MLDS to examine long-term outcomes for students who attended intervention schools compared to students who attended control schools. Preliminary analyses of MLDS data located all 42 schools initially included in the PBIS*plus* randomized controlled trial. Treatment and comparison indicators and cohort indicators were created. The next steps include examining descriptive statistics for the study sample and examining outcomes in high school and the juvenile justice system.

2.2 Dashboards and Interactive Reports

A. College Enrollment Patterns

Two new five-part dashboards were completed as part of the ongoing high school to college dashboard series. This group of dashboards, entitled *College Enrollment Patterns for Maryland Public High School Graduates*, examines the college-going patterns of Maryland public high school graduates by residency (in-state vs. out-of-state) and institution type (community college, four-year public institution, or state-aided independent institution). This dashboard series also disaggregates college enrollment by gender, race, ethnicity, and eligibility for free and reduced price meals (FARMS).

Additional information was also added to the *College and Workforce Outcomes for Maryland Public High School Graduates* series. Specifically, the dashboards now include median quarterly

wages at age 25 for the high school graduates who enroll in college. The dashboards provide a comparison of median quarterly wages to a calculated living wage²⁵ for one adult with no dependent children in Maryland. The dashboard looks at immediate college enrollment, non-traditional college enrollment and complete college enrollment. Finally, the dashboards provide disaggregated data by gender, race, ethnicity, and by eligibility for Free or Reduced Price Meals, and provide downloadable aggregate suppressed data tables.

Similarly, median quarterly wages at age 25 was also added to the series of dashboards on *College and Workforce Outcomes for Maryland Public High School Graduates with Financial Aid in the First Year of College*. These dashboards report college retention and college graduation by age 25 for high school graduates who enroll in a Maryland college and have financial aid in their first year. The dashboards include those who received loans, were awarded grants, and whose families are not expected to make a financial contribution to their educational costs.

B. High School Persisters Summary Report

The Research Branch finalized a web summary on Dr. Mathew Uretsky's²⁶ research on high school persisters and their outcomes.²⁷ High school persisters are students who have not earned a high school diploma but are still enrolled after the end of their fourth year of high school, often continuing for a fifth and even sixth year of high school. The summary looks at the similarities and/or differences, in terms of demographic characteristics, academic preparation, and college and career outcomes, when comparing persisters and dropouts. This study used descriptive statistics, data visualization, and multilevel modeling to examine the differences between persisters and dropouts.

C. Brain Gain

The Center completed a new report provided on the website entitled, *Evidence of Brain Gain in Maryland*.²⁸ Brain gain occurs when out-of-state students attend a Maryland college or university and then remain in Maryland engaged in the State's workforce. The report provides an analysis of Maryland data, a national perspective on brain gain and drain, and policy implications.

²⁵ The Massachusetts Institute of Technology has developed a living wage calculator which includes data on the cost of living in various geographic areas across the United States. The living wage calculator incorporates the cost of food, housing, health insurance, transportation, taxes, clothing, and other personal items to derive the minimum annual income required for basic self-sufficiency.

²⁶ Dr. Mathew C. Uretsky is an investigator with the MLDS Center and received his Ph.D. from the University of Maryland School of Social Work in 2016. He is a faculty affiliate at the University of Maryland School of Social Work and is an Associate Professor at Portland State University.

²⁷ <https://mldscenter.maryland.gov/HighSchoolPersistersSummary.html>

²⁸ <https://mldscenter.maryland.gov/braingain2022.html>

D. Annual Reports for the Department of Legislative Services

The Center completed the annual *High School Pathway* report. The pathway provides an analysis on college-going and college degree attainment for Maryland public high school graduates. The Center also completed the *Dual Enrollment Course and Credits* analysis. This analysis looks at dual enrollment credit attainment and college-going patterns. Both reports are used by the Department of Legislative Services (DLS) to prepare the annual Higher Education Overview. This is the sixth year the Center has provided the pathway to DLS and the fourth year the Center has provided the dual enrollment analysis to DLS.

E. Other Stakeholder Reports

The Center completed its annual reports for the Maryland Business Roundtable on high school scholars and college-going and for the Maryland State Department of Education (MSDE) on Career and Technical Education and Special Education. The latter two reports support MSDE's federal reporting requirements.

2.3 Reports

A. Dual Enrollment Reporting

The MLDS Center is required (see Ed. Art. § 24-703.1, Annotated Code of Maryland) to produce an annual dual enrollment report that provides the number of students who are dually enrolled and the number and course name of the courses in which a student is dually enrolled at the high school and at the public institution of higher education. The 2022 Dual Enrollment in Maryland Report was completed and submitted to the General Assembly and the Governor and is available on the MLDS Center website.

In addition to the annual report, the MLDS Center also produces a series of dual enrollment data tables for the Department of Legislative Services and a dual enrollment dashboard series on the website. The dashboards were recently updated and include expanding the county-level dashboards to include dual enrollment patterns by free and reduced price meals (FARMS).

B. Career Preparation Expansion Act Report

The MLDS Center, in partnership with the Governor's Workforce Development Board, is required by the Career Preparation Expansion Act (see Ed. Art. § 21-205, Annotated Code of Maryland) to produce a report on the following outcomes for high school graduates five years after graduation: wages earned, hours worked per week, and the industry of employment. The 2022 was completed and submitted to the General Assembly and the Governor and is available

on the MLDS Center website. This year, the report is streamlined and only addresses the statutory reporting requirements that can be fulfilled with MLDS data.

In addition to the 2022 report, the Center published two supplements to the annual 2021 Career Preparation Expansion Act report. The first supplement looks at the difference in outcomes pre and post COVID-19. The report highlights that all high school graduates were affected by the COVID-19 economic shutdown; however, the impact was larger for those with a Bachelor's degree and for females and Hispanics. The second supplement has been reviewed and will be released at the end of December.

C. Blueprint Teacher Preparation and Diversity Report

Pursuant to the Blueprint for Maryland's Future, Chapter 33 of 2022 (see Education Article § 5-413, Annotated Code of Maryland), the MLDS Center, in consultation with MSDE and MHEC, was required to produce a report on the progress made in increasing the preparation and diversity of teacher candidates and new teachers in the State as required by the Blueprint for Maryland's Future. The report was submitted on time to the Accountability and Implementation Board (AIB), the General Assembly, and the Governor on July 1, 2022.

This first version of this annual report primarily contains a discussion of the reporting requirements. In some cases, the requirement is asking about progress on processes and procedures that have not yet been implemented. In other instances, the data are not currently available to address the question and the report discusses how those data gaps can be resolved or how alternative approaches may address the question. Finally, there are other areas where data are available and more time is needed to work with stakeholders to address a variety of issues necessary to operationalize the question. This includes defining terms, establishing measurements, analyzing data limitations, determining accurate data sources, and then conducting the data analysis. The MLDS Center is committed to answering these questions in subsequent reports and will provide results as soon as the data are available and the analyses are complete.

A full copy of the report is available on the MLDS Center website.²⁹

D. Out-of-Home Placement and Higher Education Participation

The MLDS Center is required (see Ed. Art. § 24-703.1 (b), Annotated Code of Maryland) to produce an annual dashboard with information, disaggregated by county, regarding the

²⁹https://mldscenter.maryland.gov/egov/publications/CenterReports/ProgressinIncreasingthePreparationandDiversityofTeacherCandidatesandNewTeachers/BlueprintTeacherCertReport_Final_7-1-2022.pdf

experience of former children in out-of-home placements and how out-of-home placement affected participation in higher education. This requirement was established during the 2021 legislative session (see Chapter 306, Laws of 2021). The Center entered into a data sharing agreement with the Department of Human Services (DHS) in February 2022 and began receiving DHS data in the summer of 2022. This year will be the first year that the Center has data to fulfill this reporting requirement. The Center worked with stakeholders to operationalize the reporting requirements defined under state statute to produce the first dashboard this year. A full copy of the report will be posted on the MLDS Center website.

E. Montgomery College Graduate Outcomes

Dr. Mathew Uretsky has been conducting analyses to complete a report requested by Montgomery College. Montgomery College requested an analysis of the labor sector and wages for four cohorts of Associate's degree graduates, disaggregated by college major, race, ethnicity, gender and county. The analysis will look at the labor sector and wage outcomes at 1, 3, and 5 years after graduation.

Section 3. Data Determined to be Unnecessary

The Department of Labor informed the MLDS Center that three data elements from the Literacy, Adult Education, and Community Education System (LACES) are not used for any reporting and cannot be used for any measurable purpose. Accordingly, the Governing Board approved the following data elements for removal from the Data Inventory.

1. Goal
2. Status
3. Type

Section 4. Proposed or Planned Expansion of Data

A. Juvenile Delinquency

The Department of Juvenile Services (DJS) captures administrative data on youth who are involved in the Maryland juvenile justice system. These data elements were added to aid in identifying whether a youth had an interaction with DJS prior to the start of MLDS data in 2008.

1. First Complaint Date
2. First Probation Disposition Date
3. First Commitment Disposition Date

B. Child Welfare

Legislation passed during the 2021 Legislative Session changed the definition of student data to include child welfare data. Child welfare data includes data relating to a child’s experience with the child protective services, family preservation services, and state-sponsored out-of-home services. The MLDS Center is phasing in the child welfare data, beginning with out-of-home services data (this sector of child welfare data was chosen because the MLDS Center has a reporting requirement to fulfill by December 2022 on the experience of former children in out-of-home placements and how out-of-home placement affected participation in higher education (see Ed. Art. § 24-703.1 Annotated Code of Maryland). The out-of-home services data elements added this year include the following.

- | | |
|---|---------------------------------------|
| 1. Person ID | 21. State Assigned Student ID (SASID) |
| 2. First Name | 22. Jurisdiction of Authority |
| 3. Preferred Name | 23. Region of Authority |
| 4. Middle Name | 24. Jurisdiction of Placement |
| 5. Last Name | 25. Region of Placement |
| 6. Generational Code or Suffix | 26. Out of Home Services Type |
| 7. Date of Birth | 27. Removal Reason |
| 8. Gender | 28. RemovalID |
| 9. American Indian or Alaska Native | 29. Case ID |
| 10. Asian | 30. Removal Date |
| 11. Black or African American | 31. Return Date |
| 12. Native Hawaiian or Other Pacific Islander | 32. Return Reason |
| 13. White | 33. Placement ID |
| 14. Hispanic/Latino Ethnicity | 34. MacroPlacement Type |
| 15. Social Security Number (SSN) | 35. Family Placement Type |
| 16. Address Type | 36. Placement Type |
| 17. County of Residence | 37. Placement Start Date |
| 18. School Name | 38. Placement End Date |
| 19. School ID | 39. Placement County |
| 20. Change of School Indicator | 40. Removal Count |

C. Credentials

Credentials represent a new domain containing data on a resource that defines a competency or qualification, achievement, personal or organizational quality, experience, attribute, or aspect of an identity typically used to indicate suitability. The first credentials data to be included are from Microsoft/Certiport.

The Microsoft certification data contains Microsoft certification testing results of Maryland students. Certiport is the service used by Microsoft to provide its industry certification testing. The data elements include the following.

- | | |
|--------------------------------------|------------------------------------|
| 1. Microsoft Student ID | 12. Test Center Zip Code |
| 2. Certiport Student Username | 13. Exam Reference Number |
| 3. State Assigned Student ID (SASID) | 14. Exam Name |
| 4. Last Name | 15. Test Language |
| 5. First Name | 16. Test Score |
| 6. Middle Name | 17. Test Date |
| 7. Date of Birth | 18. Pass/Fail/Incomplete Indicator |
| 8. Gender | 19. Test Modality |
| 9. Certificate/Program Name | 20. License or Voucher |
| 10. Test Center ID | 21. Maryland Residence |
| 11. Test Center Name | |

D. Correctional Education

The Department of Labor’s Division of Workforce Development and Adult Learning requested that an additional data element be added to the MLDS to support matching and identity resolution. Specifically, the data element is the Student Identification Number. This number does not change per record regardless of how many times the inmate is arrested and will be routinely collected beginning in March 2022.

1. Student Identification Number

E. High School Data

Based on the Blueprint for Maryland’s Future, new data elements were added to MSDE’s High School Data Collection (HSDC) starting with the 2021-2022 school year. The requirements for the College and Career Readiness (CCR) determination were changed and data points on a 9th grade tracker system were required. Of the new elements that MSDE added to the HSDC, the Governing Board agreed to include only two new data elements related to ninth grade credits and course failures. Since the other elements related to college and career readiness were unsettled and subject to change, the Board declined to add them to the data inventory, preferring to wait for the final data elements to be established.

1. 9th Grade-Credits Accumulated
2. 9th Grade-Semester Core Course Failures

F. Teacher/Staff Data

A new National Board Certification data element is being added to the MSDE Staff Data Collection beginning SY 2022-2023. The data element will indicate Yes or No whether or not a teacher is National Board Certified by the National Board for Professional Teacher Standards.

1. National Board Certification

G. Attendance Data

Two new data elements are being added to the MSDE September Enrollment Data Collection beginning SY 2022-2023. The Governing Board approved inclusion of the data elements in the MLDS Data Inventory.

1. Pre-K Tier Status
2. Federal Poverty Level

H. Literacy, Adult, and Community Education System (LACES) Data from Labor

One addition to the Literacy, Adult Education, and Community Education System (LACES) data collection from the Department of Labor is, “Agency.” This data element indicates which subgrantee provided services to a student.

1. Agency

I. Maryland Health Occupation Boards and Commissions

Relevant demographic and health care data elements were identified with the Maryland Board of Nursing to help support the reporting requirements of the [Commission to Study the Health Care Workforce Crisis in Maryland](#). The data elements for inclusion below have generic names so they can serve as a comprehensive list of elements for all Health Occupation Boards and Commissions.

- | | |
|---|--|
| 1. First Name | 31. License Expiration Date |
| 2. Middle Name | 32. Certification Number |
| 3. Last Name | 33. Certification Type |
| 4. Maiden Name | 34. Certification Title |
| 5. Generational Code or Suffix | 35. Initial Certification Date |
| 6. Date of Birth | 36. Certification Renewal Date |
| 7. Gender | 37. Certification Expiration Date |
| 8. American Indian or Alaska Native | 38. Issuing Entity |
| 9. Asian | 39. Issuing Entity Identifier |
| 10. Black or African American | 40. Currently Practicing/Active Status |
| 11. Native Hawaiian or Other Pacific Islander | 41. 1000 hours or graduated in last 5 years |
| 12. White | 42. Completed Board approved refresher course |
| 13. Other | 43. Employment Status |
| 14. African American/Non-Hispanic | 44. Type of Position |
| 15. White/Non-Hispanic | 45. Number of Years Active in Field |
| 16. Social Security Number (SSN) | 46. Major Clinical Teaching/Practice Area Code |
| 17. Home Address | 47. Active Licenses in Other States |
| 18. Home City | 48. Inactive Licenses in Other States |
| 19. Home State | 49. Type of Original Program |
| 20. Home Zip Code | 50. Year of Graduation from Original Program |
| 21. Home County Code | 51. Original Program |

- | | |
|---------------------------------------|---|
| 22. Employment Location | 52. School of Nursing where B.S.N. Obtained |
| 23. Primary Work Location Zip Code | 53. Graduate School |
| 24. Primary Work Location County Code | 54. Highest Education |
| 25. Primary State of Residence | 55. School Code |
| 26. License Number | 56. Degree Received |
| 27. License Type | 57. Discipline Status |
| 28. License Title | 58. Assessment Name |
| 29. Initial License Date | 59. Assessment Result |
| 30. License Renewal Date | |

J. Grads2Careers Data from Baltimore's Promise - External Temporary Data

Researchers from Baltimore's Promise have a research project that requires the addition of temporary external data to the MLDS. The data will allow researchers to conduct a program evaluation on their Grads2Careers career pathways program. This data will be brought into the system, matched, and removed from the system when they have completed their research. The data consist of demographic elements for matching purposes and a variety of program participation information. The data elements approved for temporary addition are below.

- | | |
|---------------------------------|---------------------------------------|
| 1. First Name | 15. Program/Training Provider Name |
| 2. Middle Name | 16. ProgramType |
| 3. Last Name | 17. Program Track |
| 4. Date of Birth | 18. Program Enrollment Date |
| 5. Gender | 19. Program End Date |
| 6. Social Security Number (SSN) | 20. Program Address |
| 7. Home Address | 21. Program City |
| 8. Home City | 22. Program State |
| 9. Home State | 23. Program Zip Code |
| 10. Home Zip Code | 24. Credential Earned |
| 11. Race | 25. Program Length |
| 12. Ethnicity | 26. Program Cycle |
| 13. Parenting Status | 27. Outcome Status |
| 14. Housing Status | 28. Job in the Field |
| | 29. State Assigned Student ID (SASID) |

K. Baltimore City School Choice Data

Researchers from the Baltimore Education Research Consortium and Baltimore City Public School System have proposed to add temporary external data to the MLDS to conduct research for the Postsecondary and Labor Market Effects of Career and Technical Education in Baltimore City Public Schools project. This data will be brought into the system, matched, and removed from the system when they have completed their research. The data consist of demographic

elements for matching purposes and a variety of CTE-related content elements. The data elements proposed for temporary addition are below.

- | | |
|--------------------------------------|----------------------------|
| 1. State Assigned Student ID (SASID) | 9. CTE Program Name |
| 2. Local Student ID | 10. RDD Running Variable |
| 3. Last Name | 11. Enrollment Offered |
| 4. First Name | 12. CTE ID |
| 5. Middle Name | 13. CTE Exposed |
| 6. Generational Code or Suffix | 14. CTE Concentrator |
| 7. Date of Birth | 15. CTE Super Concentrator |
| 8. Cohort Year | 16. CTE Specialist |

Section 5. Recommendations Made by the Governing Board

1. The MLDS Governing Board recommends support for legislation amending SB 644 (CH 577, 2022)³⁰ - *Education - Student Financial Aid - Outreach Plan and Reporting*. Specifically, the recommendation is to change Education Article § 7-212(c), Annotated Code of Maryland, to assign the FAFSA completion reporting responsibilities to the MLDS Center. The Center, in consultation with MHEC and each agency's Assistant Attorney General, has determined that the Center is able to access the FAFSA completion data in the federal Student Aid Internet Gateway (SAIG) and the Maryland College Aid Processing System (MDCAPS). This access will allow the Center to directly collect FAFSA completion information at the student level, incorporate the FAFSA completion data into the MLDS, and match those data against data already submitted to the MLDS Center by MSDE. This approach would also allow for more in-depth analysis while also eliminating the requirement for local education agencies to report FAFSA completion rates to the MLDS Center.
2. The MLDS Governing Board recommends that the Center's base budget be expanded to provide additional staffing and resources necessary to meet increased demands for research, reporting and collaboration with various stakeholders and policymakers, including work supporting the implementation of the Blueprint for Maryland's Future.

³⁰ <https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/sb0664/?ys=2021rs>