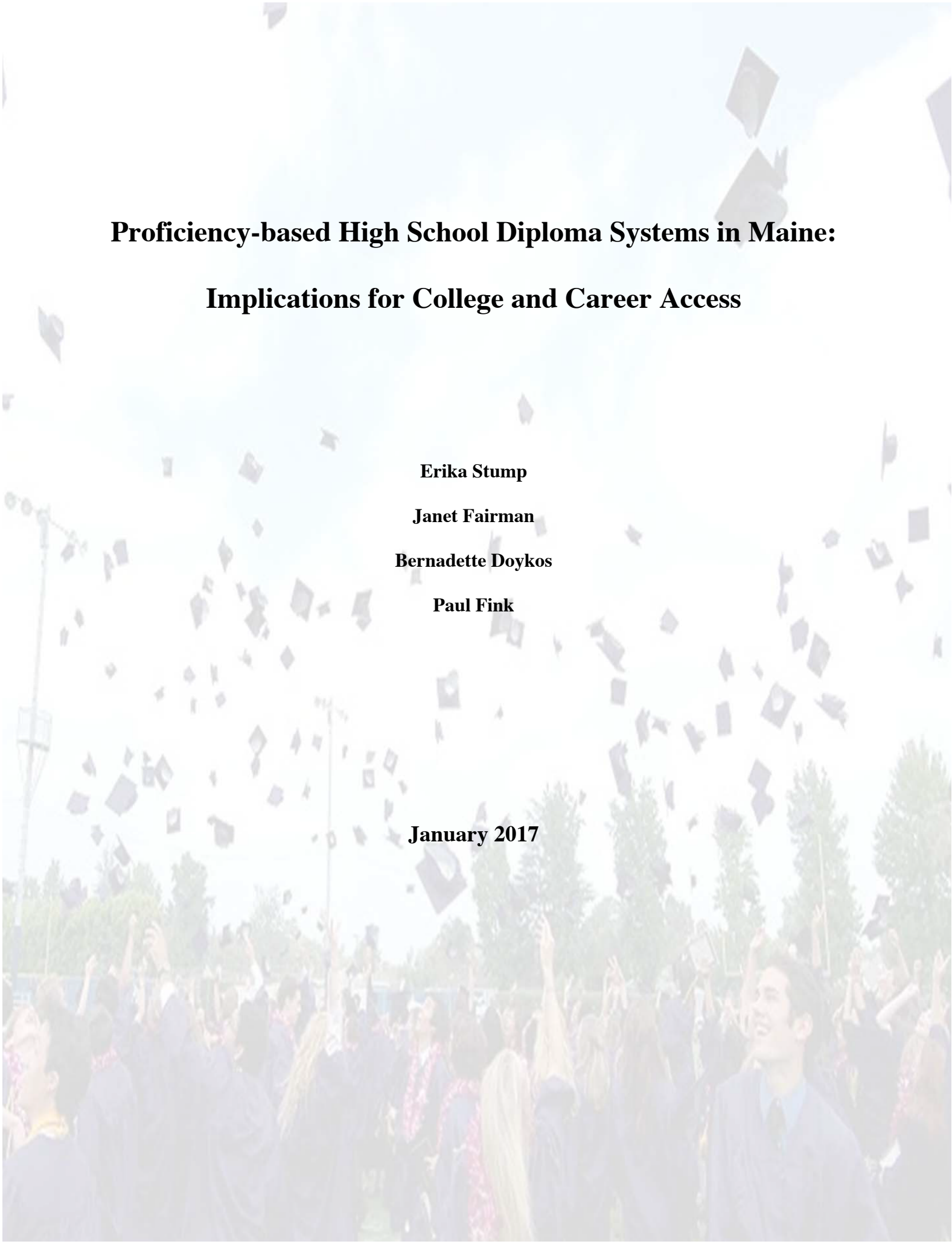

Proficiency-based High School Diploma Systems in Maine:

Implications for College and Career Access

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Executive Summary

In the 127th Legislative Session, *An Act to Implement Certain Recommendations of the Maine Proficiency Education Council* (S.P. 660 - L.D. 1627) was passed into law as Chapter 489 amending the chaptered law *An Act to Prepare Maine People for the Future Economy* (S.P.439 - L.D.1422) passed in 2012 requiring Maine school districts to implement proficiency-based diploma requirements and standards-based education systems.

Beginning in 2012, to further understand these proficiency-based diploma policies within the state and global context as well as the implementation work in local schools and school administrative units. The Maine Legislature's Joint Standing Committee on Education and Cultural Affairs has requested for the past five years that the Maine Education Policy Research Institute's (MEPRI) annual work plan include studies designed to compile data, examine progress and explore impacts regarding implementation of this state policy within local institutions and school districts across the state.

In 2016-2017, Phase V of this study shifted from the general perceptions and practices of schools and districts implementing proficiency-based high school diploma systems (as explored in Phases I-IV) to the examination of the policy implications within key programs, contexts and populations. This report shares research conducted to examine the alignment of proficiency-based diploma systems with *college* eligibility and admissions requirements as well as identify postsecondary *career* entry requirements and attributes of high quality workers.

Findings suggest that most college admissions, scholarship selection and athletic eligibility processes still heavily rely on traditional components, such as grade point average, standardized test scores, course selection and grades. Admissions officers indicated that a precise, informative school profile and clear transcript with student information that could be compared to other applicants was important. Although participants in this study said they had not received many proficiency-based high school transcripts yet, they communicated that it would be critical to explain changes and felt proposed changes have the potential to be a "less reductive way of evaluating students." Representatives from Maine businesses and professional organizations described high quality entry-level job applicants as dependable and positive with a strong work ethic as well as being adaptable to changing markets or leaders. Employers said that

they expected high school graduates to demonstrate a common level of basic literacy in reading, writing, mathematics and technology. Many participants from Maine businesses emphasized that their organizations needed employees who understood local as well as global economic systems and demonstrated collaboration in a team-oriented environment in addition to solid communication skills.

Proficiency-based High School Diploma Systems in Maine: Implications for College and Career Access

Maine Education Policy Research Institute

Context: National Standards-based Education

Although present in education practice and theory for decades, the publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983), provided standards-based education greater traction in U.S. public schools. In the following two decades, several states (e.g., California, Kentucky, Maryland, Massachusetts, North Carolina and Texas) and professional organizations (e.g., American Association for Advancement of Science; National Council of Teachers of English; National Council of Teachers of Mathematics) began integrating work involving standards-based education methods. In 1994, *Goals 2000: Educate America Act* (PL 103-227) was developed to assist states in creating statewide academic standards and created momentum for the nationwide movement towards standards-based education to obtain related funding (Armour-Garb, 2007; Cross, 2004).

In 2001, the No Child Left Behind (NCLB) Act was passed. Using the 1964 *Elementary and Secondary Education Act* (ESEA) as a precursor and receiving bipartisan support, NCLB embraced a standards-based accountability approach by requiring annual standardized testing and Adequate Yearly Progress for schools to receive Title I funding. Since NCLB was signed into law in 2001, many school districts across the U.S. have worked to implement standards-based education. Nationally, forty-six states and the District of Columbia have adopted the Common Core State Standards (CCSS), which identify content area skills and knowledge students should be able to demonstrate in Mathematics and English Language Arts so as to be college and career ready by the completion of high school.

Correspondingly, a number of national evaluations of CCSS have examined the implementation and impact of standards-based education on student outcomes. The findings suggest that many states have varied definitions of proficiency and dissimilar standards (Carmichael et al., 2010; Jennings & Bearak, 2014; Lee, Liu, Amo & Wang, 2014; Phillips, 2016; Porter, Polikoff & Smithson, 2009). A lack of common operational definitions may complicate the attempt to draw causal conclusions regarding the "success" of standards-based

education from related literature as well as local efforts to analyze internal data or implement experimental interventions with fidelity. However, it is evident that the interrelated and contextual nature of implementing related standards-based policies must be recognized in order to better understand intended and unintended impacts (Honig, 2006; Young & Lewis, 2015).

While research evidence from Maine supports findings from the national literature which emphasize that changes must be implemented at the systems-level in order to yield the intended results of increased college and career readiness (Chrispeels & Gonzalez, 2006; Noell & Gansle, 2009; Stump & Silvernail, 2014). The contexts of schooling cumulatively inform students' real experiences across their classrooms, institutions, districts and communities, with each level working concurrently to put these reforms into practice.

Context: Proficiency-based Education Policy & Research in Maine

Culminating standards-based work from earlier decades, the *Maine Learning Results* were adopted by the Maine Legislature as statewide K-12 education standards in 1997 with the passing of *Resolve, Regarding Legislative Review of Chapter 131: Rules for Learning Results, a Major Substantive Rule of the Department of Education* (H.P. 1093 - L.D. 1536). These standards, developed by Maine educators and educational leaders, included eight academic content areas as well as "Guiding Principles" that reflected expectations of high school graduates to demonstrate civic engagement in addition to certain habits of work and mind. Rule Chapter 131 for the Maine Department of Education (MDOE) described the content standards to be in effect starting in 2012 as "College and Career Readiness Anchor Standards" for the included content areas. School districts aligned curriculum, local assessments and professional development to these standards in various degrees across the state during this time.

The *Maine Learning Results: Parameters for Essential Instruction* were reviewed and then updated in 2007, with critical changes to content areas standards and the guiding principles. At that time, legislation was passed requiring the annual state assessments to reflect students' proficiency levels as defined by the updated standards in Mathematics, Reading, and Science. In addition, the updated *Maine Learning Results* were formally integrated within state policies related to school funding and school accountability measures. Although a statewide attempt to require a common local assessment system based on the *Maine Learning Results* standards ended

unsuccessfully in this same year, practitioners had dedicated significant time across the past decades discussing standards with students as well as building standards-based curricula and assessments (Miller, 2001; Stump, Silvernail, Fallona & Moran Gunn, 2013; Stump & Silvernail, 2014). In 2011, Maine adopted the Common Core State Standards in Mathematics and English Language Arts. Although state law and the Maine Constitution prohibit a mandatory statewide curriculum, the Maine Department of Education (MDOE) encouraged and supported local efforts to align curriculum and assessments to the state-developed *Maine Learning Results*.

In May 2012, the 125th Maine Legislature passed the chaptered law *An Act to Prepare Maine People for the Future Economy* (S.P.439 - L.D.1422). Within this mandate, Statute 4722-A describes the required components of the proficiency-based high school diploma, which all public Maine school districts were expected to incorporate by 2018. In 2015, the MDOE granted extensions postponing the deadline for full implementation into 2020 for many public school districts in the state. Again, although curriculum, teaching practices, local assessments and learning materials are determined entirely at the district or school level, this state law required school administrative units to implement high school graduation requirements that were dependent upon students demonstrating proficiency in the eight content areas and guiding principles of the *Maine Learning Results*. In the 127th Legislative Session, *An Act to Implement Certain Recommendations of the Maine Proficiency Education Council* (S.P. 660 - L.D. 1627) was passed into law in Chapter 489. This more recent legislation amended the original 2012 proficiency-based education law in several ways, including:

- Adapting the timeline for mandated phase-in of local high school diploma requirements reflecting student demonstration of proficiency starting in 2020-2021 (four core content areas) and completing implementation in 2024-2025 (eight content areas and guiding principles);
- Defining expectations of students with disabilities to "become eligible for a diploma by demonstrating proficiency in state standards established in the system of learning results through performance tasks and accommodations that maintain the integrity of the standards as specified in the student's individualized education program by the student's individualized education program team..."

- Requiring that schools must maintain a "permanent academic transcript" for each student, on which a school administrative unit must certify each student's achievement of proficiency in each content area and the guiding principles as well as report content area proficiency certifications to the Maine Department of Education;
- Requiring the Commissioner adopt or amend rules by January 2, 2017 to "allow local flexibility and innovation" and "identify the manner in which the opportunities for learning in multiple pathways of career and technical education programs may be used to satisfy certain components of the system;"
- Amending prior language of "*student* shall study" in all eight content areas to say that the *school* "shall ensure sufficient opportunity and capacity through multiple pathways for all students to study and achieve proficiency" in the required eight content areas.

Maine's education history reveals a strong tradition of standards-based education with on-going, complex implementation occurring in schools and classrooms across the state reinforced by substantial investment and support from various local business organizations and education reform agencies. This work has been underscored by the proficiency-based high school diploma systems mandated and updated in the most recent state legislation. To further understand these proficiency-based diploma policies within the state and global context as well as the implementation work in local schools and school administrative units, the Maine Legislature's Joint Standing Committee on Education and Cultural Affairs has requested that the Maine Education Policy Research Institute's (MEPRI) work plan for the past five years include studies designed to compile data, examine progress and explore impacts regarding implementation of this state policy within local institutions and school districts across the state. MEPRI is a nonpartisan research institute funded jointly by the Maine State Legislature and the University of Maine System, with a mandate to collect and analyze education information and perform targeted education research for the Legislature.

A summary of each phase of this ongoing study's findings is presented below. Detailed evidence from this year's targeted research regarding college and career access as part of Phase V work is discussed in the "Findings" sections of this report.

Phase I: Preliminary Implementation of Proficiency-based Diploma Systems in Maine (A School Level Analysis)

In 2012, MEPRI conducted an initial study that examined the preliminary development, costs and impacts of standards-based *school* programs being implemented in Maine. Nine public institutions, including those representing various configurations of grades PK-12, served as case studies in which this approach was being practiced in some or all classrooms.

This study revealed that Maine educators and educational leaders were working diligently to embrace and apply the underlying philosophies of standards-based education as well as build systems applicable to their local context. Institutions beyond the initial phase of shifting belief structures and school culture were grappling with the logistics of implementing some of the changes they saw as necessary within curriculum, scheduling, staffing and reporting achievement. Further discussion of the findings from Phase I of this study of Maine public institutions may be found in the report, *Preliminary Implementation of Maine's Proficiency-Based Diploma Program*, or available at <www.usm.maine.edu/cepare>.

Phase II: Implementation of Proficiency-Based Diploma Systems in Maine (A District Level Analysis)

After sharing the findings and recommendations of Phase I with the Maine Legislature's Joint Standing Committee on Education and Cultural Affairs and in the publication of the report mentioned above, a second year of the study was commissioned in 2013 to focus on school *districts* that were in the process of systemically implementing S.P.439-L.D.1422. Phase II examined the systemic benefits and challenges of putting this state law into practice. Findings revealed that district leaders were working attentively to implement these policies with fidelity. District leaders also indicated that a key goal of their implementation was developing practices and policies that were beneficial to all students in their district even when practitioners were faced with challenges of creating common definitions, developing practical learning management systems and finding resources to support their work. Further discussion of district implementation of the law examined in Phase II of this study may be found in the report, *Implementation of a Proficiency-Based Diploma System in Maine: Phase II - District Level Analysis*, available at <www.usm.maine.edu/cepare>.

Phase III: Implementing Proficiency-Based Diploma Systems in Maine
(An Analysis of District-Level High School Graduation Policies)

In 2014, the MDOE required public school districts to submit a Confirmation of Readiness or an Extension Application outlining the policies and practices in place and planned for implementation of a proficiency-based diploma system. Subsequently, the MDOE provided a response letter with feedback and recommended action to each district as well as conducted several in-person district visits. Maine's law S.P.439-L.D.1422 required students to demonstrate proficiency in eight content areas (English Language Arts, Mathematics, Science and Technology, Social Studies, Health Education and Physical Education, Visual and Performing Arts, Career and Education Development as well as World Languages) in order to earn a high school diploma. This third phase of the MEPRI study focused on *high school graduation requirements* in the content areas of English Language Arts (ELA), Mathematics and Science. Many of the district policies and proposals were intended to eventually apply to all eight mandated content areas. However, ELA, Mathematics and Science were the areas with the most substantial level of implementation and established policy development within local districts at this point.

In Phase III of the study, a comprehensive examination of the application documents, practices, policies and standards of several case study districts provided insights into the development of local high school graduation policies aligned with Maine's proficiency-based diploma legislation. In addition, high school administrators and district leaders in case study districts were interviewed and discussed the continued impact of this state policy on their local district and institutions. Participants indicated that building a proficiency-based diploma system had encouraged more professional collaboration in institutions, improved transparency in communication about student achievement, and had inspired school improvement efforts in some districts. The data revealed that districts were working diligently to align PK-12 curricula and policies to their local standards as well as developing common language and expectations within the district. However, comparing the academic content standards and definitions of proficiency from various school districts across the state highlighted many practices and policies that were not common statewide. Implementing this state policy appeared to require substantial professional work. School and district administrators suggested that they wanted greater clarity and consistency from the state level with regard to the required components of the law. But, local

stakeholders also adamantly supported the retention of local control over defining proficiency benchmarks and developing standards that were perceived as accessible and relevant to their student population. Further discussion of high school graduation policies examined in Phase III of this study may be found in the report, *Proficiency-based Diploma Systems in Maine: Implementing District-level High School Graduation Policies (Phase III Technical Policy Report)*, available at <www.usm.maine.edu/cepare>.

Phase IV: Implementing Proficiency-Based Diploma Systems in Maine
(A Longitudinal and Updated District Level Analysis)

Phase IV of this study collected data from qualitative interviews and document analysis in six case study school *districts* in 2015. Three of these districts had been involved in at least one year of Phase I-III of this study, allowing for exploration of ongoing implementation practices and comparing perceived challenges and benefits from initial implementation to later stages. School districts were still at various stages of implementation and utilizing proficiency benchmarks and language to describe content standards that were varied across the state yet increasingly common within a district. Findings from Phase IV suggested that school districts made great strides and were continuing work to improve interventions to support students who did not meet the standards. Where these proficiency-based diploma systems had been enacted, increased communication and strategies for remediation were reported as advancing student performance and contributing to an enhanced culture of learning. This work encompassed increased collaboration among teachers, families and leaders surrounding students' progress, and many educators spoke of the benefits of "breaking down the walls" of the teaching profession. School and district administrators described public relations and systems-wide strategies that facilitated communication within their organizations and the community at large as well as the challenges of implementing this state mandate.

Further discussion of impacts of implementation examined in Phase IV of this study may be found in the report, Proficiency-based High School Diploma Systems in Maine: Local Implementation of State Standards-based Policy, available at <www.usm.maine.edu/cepare>.

Phase V: Implementing Proficiency-Based Diploma Systems in Maine (Implications for College and Career Access, Special Education, Career and Technical Education, and High School Graduation Standards)

In 2016-2017, Phase V of this study shifted from the general perceptions and practices of institutions and districts implementing proficiency-based high school diploma systems to the examination of the policy implications within key programs, contexts and populations. Document review and interviews were conducted with *college* admissions' personnel to gather data regarding alignment of proficiency-based diploma systems and college eligibility and entry requirements. In addition, leaders and representative personnel from and Maine businesses and the U.S. military were interviewed to identify postsecondary *career* entry requirements and attributes of high quality workers. Another area of inquiry in this phase of the study included analysis of data from interviews with leaders and educators in *Special Education* to examine the perceived challenges, benefits and impacts of this diploma policy on students with identified disabilities and special education programming provided by Maine's public PK-12 school districts. In addition, qualitative case studies of a sample of Maine *Career and Technical Education* centers and regional vocational programs were conducted. Finally, a single school district case study was incorporated into this phase of the research to closely examine Maine public educators' and school administrators' interpretations and perceptions of establishing standards and *defining proficiency* levels in content areas and developing district-level policies for proficiency-based high school graduation policies.

Therefore, Phase V of this study examining implementation of Maine's proficiency-based high school diploma policy explores several facets of the immediate and wider contexts of schooling in a series of three reports. This report focuses on the contexts of postsecondary opportunities, specifically college and career access. In this way, Part I of this Phase V report shares existing research literature regarding college access and readiness as well as empirical data from document review and interviews with college admissions personnel. Part II of this Phase V report offers a review of research literature about career access and readiness as well as workforce trends and empirical data from qualitative interviews with leaders from businesses, professional organizations and the U.S. military.

Review of Literature (Part I - College Access)

Due to substantial shifts in the economy through recent decades, which privilege the attainment of a postsecondary degree for long-term economic and personal stability, students have become subject to repeated messages regarding the importance of higher education. On average, individuals with a two- or a four-year degree earn between 50 and 100 percent more annually as compared to their counterparts who have only a high school diploma ($36,000, $46,000, and $23,500, respectively) (Aud et al., 2010). In the past decade, studies have shown that students' postsecondary aspirations to attend college have become nearly universal in the early years of high school (Conley, 2008; Perna, 2010). However, only about two thirds of all seniors enroll in college in the fall following high school graduation, and a smaller proportion graduate from college (Tuitt et al., 2011). These evident gaps in college aspirations, access and success suggest that students' postsecondary trajectories are often riddled with various obstacles, which ultimately influence their readiness to make the academic and social transition to college.

Defining College Readiness

Definitions of college readiness vary widely in both research and practice. Scholars have put forth a general definition of college readiness as the culmination of students' aggregate experiences in formal and informal educational settings that provide them with the skills required to transition into and succeed in higher education (Conley, 2007). Despite efforts to expand opportunities for college readiness, there is evidence that students' need for remedial education is greater than ever, with 42 and 36 percent of students requiring remedial coursework at two- and four-year colleges, respectively (Conley, 2013). However, this commonly used definition fails to capture the dynamic nature of developing college readiness and the multiple domains of readiness required for students to make a successful transition to and through college (Conley, 2014; Nagaoka et al., 2009). In recent years, definitions of readiness have expanded to include "noncognitive skills" as well as evidence of academic success. In addition to content mastery, another critical facet of academic readiness is students' accumulation and demonstration of the academic behaviors required to succeed in college settings. These skills include problem solving, group work, and the ability to manage one's time and responsibilities (Nagaoka, Farrington, Roderick, Allensworth, Keyes, Johnson, & Beechum, 2013). Collectively, the development and demonstration of such skills are found to enhance students' preparation in transitioning to and succeeding in college and career.

Despite evidence of particular domains of college readiness, there is no singular blueprint for what culminates in academic college readiness; however, many scholars have identified key facets of readiness (e.g., Adelman, 1999, 2006; Bryan, Young, Griffin, & Henry, 2015; Lee, 2012). For example, Adelman (1999, 2006) defined a college preparatory curriculum as four years of English, four years of math (including calculus, pre-calculus, or trigonometry), three years of science (including two lab sciences), two years of foreign language, and two years of social studies. Mazzeo (2010) suggested that students who enroll in an additional year of social studies and foreign language were more likely to be college ready than their peers who did not. In addition to pursuing a college preparatory curriculum, scholars highlight the importance of students' demonstration of curricular rigor, including honors, Advanced Placement (AP), and International Baccalaureate (IB) coursework, wherever available (Adelman, 2006; Jackson, 2012; Mazzeo, 2010). In Maine, researchers have identified four school-level indices for college readiness: timely high school graduation, academic preparation, postsecondary aspirations, and postsecondary persistence (Silvernail, Sloan, Paul, & Linet, 2014). In combination, college readiness is positioned as a topic of interest for educational practitioners and postsecondary admissions professionals alike, as it helps to facilitate the transition from high school to college.

Potential Role of Proficiency-based Education in College Readiness

The contexts in which students attend secondary school as well as available individual and institutional supports influence students' skill development towards college readiness. In recent years across the U.S., there has been an increased commitment to the expansion of proficiency-based PK-12 education as an approach to improving postsecondary readiness. To date, sixteen states (including all six New England states) have enacted state legislation or state board actions related to proficiency-based, mastery-based or competency-based education (Deye, 2016) and numerous other states are conducting pilot projects or implementing related reforms. Such efforts seek to shift students' primary and secondary learning experiences from seat time and credit accumulation to broadening opportunities for scaffolded, personalized learning through enhancing opportunities to provide students with the knowledge and skills necessary for college and career success (Blauth & Hadjian, 2016; Conley, 2014). This has been a response to the prevalent practices of high-stakes testing and sanctions-driven education reform, which illuminated the gap between the requirements for high school graduation and college readiness (Darling Hammond, Wilhoit, & Pittenger, 2014; Kirst & Venezia, 2005).

Not only are proficiency-based efforts in PK-12 schools seen as a means to expanding potential opportunities for students to command agency of their own learning experiences, they are also seen as allowing more holistic approaches to grading and assessment, moving beyond singular standardized tests as the primary measure of achievement (AASA, 2016). Recent research has found a relationship between the establishment of a proficiency-based approach in PK-12 education institutions with increased student engagement, expanded systems of intervention for students who demonstrate learning struggles, and indicators of increased collaborative work (Conley, 2013), which align with some aforementioned "non-cognitive" characteristics of college readiness.

Understanding Factors Contributing to College Access

Existing research has identified myriad factors that influence a high school graduate's selection of and matriculation in higher education immediately following high school. Although postsecondary aspirations are nearly universal by tenth grade (Conley, 2008), only 70 percent of students enroll in higher education. This gap may be attributed to a complex array of factors that contribute to and obstruct students' access to higher education. From offering rigorous academic options (Oseguera, 2012) to the creation of a college-going culture (Corwin & Tierney, 2007), schools have a substantial impact on students' postsecondary preparation and access. Scholars have identified a high school's capacity to provide college counseling is a significant contributing factor in a student's pursuit of and access to postsecondary education (McDonough, 1997, 2005). Guidance practices must be comprehensive, including identifying well-matched institutions to which a student should apply (Smith, Pender, & Howell, 2013), dispensing accurate information about deadlines and specific requirements of individual institutions' admissions process (Avery & Kane, 2004), as well as offering information regarding the complex array of financial aid options (Bettinger, Terry Long, Oreopolous, & Sanbonmatsu, 2012). Once enrolled in college, students may encounter a number of potential barriers to their success, including affordability (Perna, 1998), family demands (Valadez, 2008), and access to supportive resources to help facilitate the transition (Deil-Amen, & López Turley, 2007). When students enroll in a postsecondary institution that meets their academic, social, and financial needs, they are more likely to graduate from college in a timely fashion.

While many proficiency-based education approaches implemented in PK-12 school systems embrace comprehensive efforts to increase their student population's college readiness,

research is needed exploring the connecting factors relating proficiency-based education approaches to barriers and facilitators within the area of college access. One area with emerging research relevant to college access focuses on proficiency-based education in secondary schools as it relates to the process of college applications and admissions.

Proficiency-based Reporting and College Admissions in New England

Across New England, there is evidence of expanded commitment to proficiency-based education over the last ten years. Maine, New Hampshire, and Vermont have been leaders in state and local policy supporting proficiency-based (or competency-based or mastery-based) as well as related education reform approaches. Similarly, Massachusetts, Connecticut and Rhode Island have expanded opportunities for adoption of such approaches in individual schools. With the implementation of proficiency-based high school diploma system, students' college application materials may change significantly. Thus, as states have moved towards an expanded acceptance of proficiency-based, competency-based or mastery-based methods of reporting student achievement and educational experiences, there has been enhanced discussion surrounding how this material will be considered in the postsecondary admissions process.

Traditionally, indicators considered for college admissions have included cumulative grade point averages, evidence of rigorous course selection, and standardized test performance (AASA, 2016). Preliminary evidence is mixed, suggesting that some admissions professionals do not believe that the shift to proficiency-based diplomas would necessarily adversely affect applying students (Blauth & Hadjian, 2016) while other college admissions administrators indicated that adoption of certain proficiency-based reporting practices could omit critical information from a student's application materials currently used to distinguish applicants for admission (Silvernail et al., 2014). A proficiency-based reporting approach is perceived as a more holistic review by some college admissions personnel citing the inclusion of "habits of work" (defined as attendance, participation, and effort) and cross-cultural knowledge and skills as particularly relevant to admissions decisions (Blauth & Hadjian, 2016). Accommodations for diverse transcripts have always been a part of the admissions review process, and to date, 68 of the approximately 250 public and private institutions of higher education across New England (NEBHE, 2016) have stated "that students with proficiency-based grades and transcripts will not be disadvantaged in any way" (NESSC, 2016). However, admissions professionals' feedback also highlights the importance of developing comprehensive yet concise school profiles that

allow for contextual understanding of proficiency-based transcripts and enhance efficiency in the admissions process while providing information required for students to be eligible for college scholarships and athletic participation (Stump, Doykos, & Fallona, 2016).

Methodology (Part I - College Access)

The fifth phase of this ongoing research includes a series of studies examining the impacts of implementing proficiency-based diploma systems within the immediate and wider contexts of public schooling in Maine. This report includes research exploring implications of proficiency-based diploma policy within the contexts of college and career access. Part I of this report shares information from investigation of the implications of Maine's proficiency-based high school diploma policy as it relates to students' access to postsecondary education and was guided by the following research question:

> As Maine's PK-12 public school systems begin to implement proficiency-based high school diploma systems, what are the implications for access to postsecondary education institutions in Maine?

Sample

During the fall of 2016, MEPRI researchers from the University of Maine (Orono) conducted document review and gathered information from interviews with admissions personnel from five postsecondary institutions in Maine. In order to explore how Maine's proficiency-based high school diplomas and credentials are impacting the college admissions process and students' access to college, a sample of five public and private, large and small post-secondary institutions in Maine that represent different levels of selectivity were included. Table 1 describes the sample of institutions, with names of private institutions excluded for confidentiality purposes. Information on enrollment and acceptance rates is approximate based on data collected from interviews and public websites. Acceptance rates within some high demand health and nursing programs were substantially lower than the overall institutional acceptance rates listed in the table.

Table 1. Sample of Maine Post-Secondary Institutions in the Study

School Name	Public/ Private	4 year or 2 year programs	Admissions Type	Undergraduate Enrollment 2016	General Acceptance Rate 2016
University of Maine	Public	4 year	General & Program Specific	9,300	90%
University of Southern Maine	Public	4 year	General	6,125	90%
Eastern Maine Community College	Public	2 year	General & Program Specific	2,615	80%
Liberal Arts College	Private	4 year	General	less than 2,000	less than 20%
Business-oriented University	Private	4 year	General & Program Specific	2,700	80%

Data Collection & Analysis

For each school in our study sample, researchers first collected information on college admissions requirements from the institution's website and then interviewed an admissions officer (see Appendix A for Phase I interview protocol). The interview collected information about both the institution's requirements for admission as well as their experience with and perceptions of proficiency-based high school transcripts. Topics included the following:

- Minimum requirements for acceptance to the general undergraduate program and requirements for specific degree programs.
- Additional or preferred credentials for admission.
- Most important criteria for admissions decisions.
- Changes in high school transcripts observed by admissions staff as high schools transition to proficiency-based high school diploma systems.
- Challenges in using proficiency-based high school transcripts for college admissions decisions.

- Opportunities with the transition to proficiency-based transcripts.
- Suggestions to facilitate the use of proficiency-based transcripts for college admissions.

To narrow the scope of this inquiry, researchers focused on five undergraduate degree programs representing some areas of high employment opportunity in the coming years, both professional training programs and a liberal arts program. The undergraduate degree programs highlighted in this report include: nursing, engineering, education, business, and English. Not all of the institutions have degree programs in all five areas, so information was collected only for the programs they do offer.

Data analysis included developing a profile of each school, using a table to summarize minimum and preferred credentials for admissions generally and across the five degree program areas (see Appendix B). Interview data were summarized for each school and then compared across institutions, to allow for descriptions of patterns and themes.

Findings (Part I - College Access)

Minimum Requirements for College Admission

The following is a summary of the minimum requirements for admission to the five institutions contacted for this study. Additional information can be found in the data tables in Appendix B.

Most of the postsecondary institutions in our sample had general or "direct entry" admissions, where students were admitted to the school and then later declared their program major. By contrast, two institutions allowed students to apply for admission to specific degree programs.

The minimum requirements for admission for these institutions varied depending on the degree of selectivity for the institution and the degree program. **Required credentials considered for admission typically included: Grade point average (GPA), standardized test scores, and courses taken in high school.** Grade point average for high school coursework and standardized test scores such as the SAT were reported as important credentials for admissions decisions in all of the institutions but less so for the selective, private college and the two-year community college (EMCC).

Across the institutions in our sample, the minimum GPA expected or required varied from 2.0 up to 2.67. The highly-selective private college did not specify a minimum GPA required and reported that they placed more emphasis on other evidence of the student's accomplishments although the average GPA was above 3.50. **Program-specific admissions trends in nursing and engineering programs reported requiring higher GPAs, higher standardized test scores, and additional advanced coursework in math and science as compared to general admissions** (see tables in Appendix B for these requirements). Acceptance rates for health and nursing degrees were reported to be substantially lower than the overall institutional acceptance rates (approximately 6% at the University of Maine and 30% at the business-oriented private college and EMCC) compared to nearly 80% for general admissions acceptance rates at public institutions.

In terms of standardized testing, the highly-selective private college followed a growing national trend away from a strong reliance on testing results for admissions decisions. An admissions representative indicated that they do not require students to submit test scores, but they do use that information when provided. The community college (EMCC), because of their non-traditional student applicants, also did not require SAT or ACT scores, but used placement tests (such as the Accuplacer) to determine students' readiness for their degree programs and course enrollment. Other institutions also used placement or SAT/ACT test scores to determine course enrollment or specific program acceptance, with test score requirements varying by institution and program.

Maine's policy for standards-based education systems and proficiency-based high school diplomas requires public schools to "certify that the student has engaged in educational experiences relating to English language arts, mathematics and science and technology in each year of the student's secondary schooling" (S.P. 660 - L.D.1627) beginning in 2017 but does not mandate credit hours or course completion. High school and post-secondary coursework was prevalently cited as an important credential by all the institutions in our sample. **Admissions officers said they looked at students' course grades and level of rigor along with the school profile to explain the available curriculum and academic demand of students' course pathways**. It was reported that admissions staff used this information as indicators of the extent to which students challenged themselves and also to determine that students have the proper preparatory courses for their intended program of study.

Most of the institutions in our sample indicated an expectation that students would have four years of high school English and courses in math, science and other subjects, although the expectations for these courses varied across the institutions depending on the degree of selectivity and program-specific expectations. For example, the highly-selective private college in our study indicated that it did not have a prerequisite high school program or number of courses, but said the typical entering first-year student would have had four years each of English, foreign language, mathematics, social science and three to four years of laboratory sciences. In another example, University of Maine's College of Engineering and the School of Engineering Technology required the following courses to be completed by applicants: "English (4 units), Algebra 1 & 2, Geometry, History (2 units), one senior level math (select from trigonometry, pre-calculus, or calculus)" (University of Maine, 2016). Additionally, science high school course completion requirements for these College of Engineering applicants included Chemistry and Physics while applicants for this institution's School of Engineering Technology should have completed one additional science and Physics. The community college (EMCC) expected general admissions prospective students to have earned at least one high school credit in math and the nursing program had a prerequisite of successful completion of college-level anatomy and physiology and "nursing dosage" prior to being eligible for their program.

It was also noted that **eligibility for certain scholarships (including merit scholarships) and NCAA athletic participation also required core high school course completion and a minimum high school GPA**. For example, NCAA Division I requires college-bound student-athletes to graduate from high school and complete 16 core courses with at least a 2.3 GPA. Core courses include four years of English, three years of math (Algebra 1 or higher), two years of natural/physical science (including one year of lab science if your high school offers it), two years of social science and other additional years of various other courses. However, core courses do not include "classes in non-core areas, fine arts or vocations such as driver education, typing, art, music, physical education or welding; personal skill classes such as personal finance or consumer education; classes taught below grade level, at a slower pace or with less rigor or depth-- often titled basic, essential, fundamental or foundational; or classes that are not academic in nature such as film appreciation, video editing or greenhouse management" (NCAA, 2016). In addition, "non-traditional" courses must meet multiple criteria to be accepted

as high school courses in terms of meeting NCAA athletic eligibility, including a "definite time period for completion," "regular interaction with a [certified or qualified] teacher for instruction," "prepare students for academic work at a four-year college" and other criteria (NCAA, 2016). This designation of "non-traditional courses" could correspond with Maine's "educational experiences" outside of the traditional semester or year courses, but designation as an approved core course would be determined by personnel at the NCAA Eligibility Center.

Additional or Preferred Credentials for College Admission

When considering additional or preferred credentials of college admissions applicants in the general admissions process, the institutions in our sample noted the importance of transcripts indicating the rigor of a student's courses, such as the title of "advanced," "honors," or "Advanced Placement." Institutions in our study did not indicate that there were general course requirements for career education, health or physical education and commonly regarded coursework in visual and performing arts as preferred rather than required credentials, again depending upon the applicants' intended course of study. Although, applicants who had completed coursework in the arts and a world language were reported to be preferred by the University of Maine and the highly-selective private institution in this study.

Other experiences that admissions officers in this study said benefitted applicants for admission to their institution included internships and extra-curricular activities. Additionally, interviews with admissions and letters from high school counselors and teachers were said to be considered key components of the college application materials. While a few institutions represented in this study did not put heavy importance on the admissions essay or no longer required an essay, the University of Maine, University of Southern Maine, and the highly-selective private college still gave weight to a strong written essay. Again, program-specific admissions criteria emphasized rigorous experiences and coursework in an applicant's field of study.

Prioritized Credentials for College Admissions

Among the **most important credentials for admissions decisions mentioned in the interviews for this study included the student's GPA, standardized test scores, rigor and scope of completed coursework, written essays, and letters of recommendation**. However, the five institutions in our sample prioritized these credentials somewhat differently. Three of the five institutions in our study (UMaine, USM, and the business-oriented private college) indicated

that GPA and standardized test scores were among the most important credentials informing admissions decisions. Completed coursework was mentioned as among the most important credential in the interviews with three institutions (USM, the highly-selective private college, and EMCC). A strong, well-written essay was mentioned as among the most important credentials by three institutions (UMaine and the two private colleges). Counselor and teacher letters of recommendation were mentioned as among the most important sources of information by three institutions (USM, EMCC, and the highly-selective private college).

When asked what additional credentials would be important for admissions decisions, some institutions' admissions personnel mentioned the campus interview and extra-curricular involvement. Still, all of the institutions in our sample emphasized that their approach to admitting students involved taking a holistic view of students' credentials and all materials included in the application. Particularly if a student's GPA or test scores were less strong, admissions officers indicated that they then relied more heavily on other sources of information, such as the essay, interview, and recommendations.

Observed Changes in Recent High School Transcripts

All five institutions in our sample reported that **within the past year or more, they had received some student transcripts that provided information on students' proficiency-based educational accomplishments**. While none of the institutions had a system to track the number of applications using proficiency-based transcripts, the participants estimated that the numbers had been relatively low so far, ranging from only a "few" to roughly 10% (UMaine). It was noted that students applying from out-of-state as well as Maine students sometimes had proficiency-based transcripts.

Admissions officers said that they expected the numbers of proficiency-based transcripts to increase in the coming years as more Maine high schools transition to proficiency-based diplomas and transcripts. Participants in this study were familiar with Maine's proficiency-based diploma policy and indicated that they have been talking to secondary schools and guidance counselors around the state to field questions about what information would be needed for the college admissions process. Admissions officers reported that some Maine high schools had been proactive in contacting colleges with proposed transcript changes and asking for suggestions or preferences to make sure they provided enough information in the transcript and school profile. The college admissions personnel in this study believed this effort had been very helpful to both

high schools and postsecondary institutions, and they strongly **encouraged more high schools to communicate with colleges and universities about proposed changes**. Admissions officers also reported receiving concerned calls from parents wondering how colleges would regard the use of proficiency-based transcripts.

Admissions officers noted that there is no uniform approach currently evident among the proficiency-based high school transcripts they have seen. The examples that they had seen varied considerably both in form and content/ information provided by the secondary institution. For example, they reported that secondary institutions appeared to use a variety of labels and definitions for identifying proficiency, and transcripts or school profiles provided a range of description, from very little to extensive. Admissions officers said that, so far, most Maine high schools using proficiency-based transcripts were still including some type of traditional GPA information. It was noted that most Maine high schools still appear to report grades using a 100-point system, and some convert this to an equivalent A-F letter grade while others convert it to a 4.0 scale. Some Maine high schools were said to provide concise summaries of the how to interpret the proficiency scores. However, it was also reported that other institutions provided copious pages of narrative or sample work from the student with little to no explanation of what the proficiency ratings mean. One admissions office said,

> We're very used to seeing non-traditional methods of grading, using a variety of different scales. Some use 100-point scale, etc. Most don't compute a GPA. There is also more use of portfolios and proficiencies nationally...Transitioning to proficiency-based is not a problem. But how they provide information is so different.

Challenges with Proficiency-based High School Transcripts

Participants from the five postsecondary institutions admissions offices in this study shared some challenges they perceived with incorporating proficiency-based high school transcripts into the college admissions process. It was reported in these interviews that admissions personnel sometimes had more difficulty finding the information they needed and figuring out how to interpret the information provided in the proficiency-based transcripts they had seen. The institutions in our sample indicated there **was a need for clear and concise information to interpret the proficiency levels or ratings developed by the school or district since these were not common across the state**. College admissions officers indicated that while most secondary institutions did provide some information for this purpose, it varied in detail and

usefulness. Some institutions provided a definition of the proficiency levels along with a longer description. Others provided a detailed narrative of the student's work.

In addition to the need for defining the proficiency levels, college admissions officers in this study indicated that their decisions still put a strong emphasis on GPA. As mentioned above, a 4-point GPA was still required for merit and athletic scholarships. When proficiency-based transcripts do not include a GPA, admissions officers said they relied on the conversion scale provided by the secondary school. If the school did not provide a conversion scale, some participants indicated that admissions officers would attempt to estimate a score using the student's grades and a 4.0 scale. One admissions officer commented, "It's just trying to take that extra step to **convert the proficiency levels into an estimated GPA**."

Further, most college admissions computerized data management systems for student application information still required the GPA to be entered. An admissions officer explained, "MaineStreet [computer data management system] requires that admissions enter a student's GPA. But when institutions are using a proficiency level, there's no GPA. We have to estimate one." Admissions officers indicated it would require time and additional resources to implement any changes in computer systems to deal with non-traditional transcripts that do not include GPA information. Some admissions officers voiced concerns that trying to convert a proficiency level to a GPA may not always be fair for the student, especially students who may be on the borderline of receiving an award. One admissions officer commented,

> I worry about borderline students and even higher achieving students in regards to an admissions committee. It's all dependent on the information given. If it's clear, then it's easy. If it's a paragraph and paragraph without any quantitative measures, I can see it hurting [the student's opportunities].

Some of the admissions officers interviewed for this study did raise the issue that continued use and reliance on GPA may undermine the intent of a proficiency-based approach in the first place. However, they indicated that the admission process still placed heavy reliance on GPA for most colleges.

Another concern we heard in the interviews was that the proficiency-based transcripts were longer, included considerably more narrative to read and interpret, and therefore took more time and effort to review than traditional transcripts. Some comments to this effect included the following:

- "The main challenge is the extra time that going over proficiency based transcripts can take. This could become a problem when there are more to review."
- "It does not have an impact on the decision, but how long it takes to make a decision. It takes more time and slows down the process, and will be more so as more schools make this transition."
- "If lots of high schools begin using this approach, it will take a bit longer to review applications and transcripts. It may slow the process. We may also need to call guidance counselors in some cases for more information."

For example, one admissions officer reported that their office had received a 17-page narrative describing a student's work, which was an overwhelming amount of information. The admissions personnel in this study said they had not yet determined how to deal with this type of transcript. Given that many secondary institutions in Maine had yet to transition to a proficiency-based diploma and transcript, college admissions staff expected the number of these transcripts to increase over the next few years as the mandated deadline for implementation was realized. College admissions staff in this study raised **concern about the increased time and perhaps staffing needed to handle proficiency-based transcripts** and emphasized that it was important for secondary institutions to clearly define and explain their proficiency scores or levels.

College admissions officers also said their offices looked beyond the GPA to the level of coursework students have completed. Consistently, we heard that college admissions put considerable weight on students demonstrating a pattern of engaging in college preparatory or advanced coursework, as an indicator that students have taken advantage of the most rigorous courses available in their secondary institutions. Therefore, having a transcript that listed course titles (not just standards) appeared important for college admissions processes. In addition to a list of courses completed, college admissions officials also said they relied on the school profile document provided by the secondary school to explain the school's curriculum and what course pathways and levels were available. Other information, such as the percentage of students in the school who completed advanced courses or achieved higher levels of proficiency, was also mentioned as helpful. One admissions officer explained the importance of the school profile and some comparative information on the student's program of study by saying,

> We cannot do our job without the school profile! It's very important—the keystone to understand the grading scale, the courses offered, etc. We prefer not to make a decision

without the school profile. Some institutions are under-resourced and don't have a school profile... Sometimes we don't have information evaluating the rigor of the student's program compared to other students in the school. The Common Application asks counselors to provide this, and some counselors don't provide that, but it is so essential.

Opportunities with Proficiency-based High School Transcripts

One opportunity that admissions officers mentioned with regard to using proficiency-based transcripts was that it encouraged the college admissions review process to increase attention to the whole student. Traditional transcripts may encourage a focus on GPA and standardized testing scores, but admissions staff said they felt that the proficiency-based models provided an opportunity to place more weight on other criteria. One admissions officer said, "The idea of shifting to learning from testing is a good thing." It was noted that the shift would be a positive change in how colleges evaluate students' abilities. Another admissions officer described the shift to looking at other credentials and information as a positive change also, "**Proficiency-based transcripts force us to think more about how students learn in the U.S. It's a less reductive way of evaluating students**. It may also make us look more carefully at extracurriculars."

Another potential opportunity participants in this study suggested may be provided by proficiency-based transcripts was less emphasis on GPA, class rank, or other traditional quantitative measures. College admissions personnel admitted that changing this emphasis could reduce the emotional stress high school students experience regarding such competitive rankings. In this way, **a proficiency-based approach was considered by participants in this study as a possible method to encourage students to focus on the bigger picture of their learning rather than numeric indicators**. An admissions officer discussed proficiency-based education, saying,

> [It] takes the pressure off to be better, the best student. For institutions with intense competition, this helps to alleviate this pressure for students . . . so not just excelling academically but working together, being kind, how much do you know, rather than GPA as important.

Some admissions officers noted that Maine high schools were still in the early stages of implementing this policy requiring proficiency-based high school transcripts, thereby providing opportunities for school districts to examine some of the models being used, share ideas, and

adopt practices that appear to be working well. One admissions officer said, "We have the opportunity to hold up institutions that are doing [proficiency-based high school transcripts] well so that other institutions can get on that format." Some secondary institutions were experimenting with different models and styles of transcripts that used proficiency-based scoring, and college admissions officers reported that they were reviewing those models and providing feedback to institutions. For example, a Maine school-support organization, Great Schools Partnership (2016), developed models for proficiency-based high school report cards and transcripts and "recommend[s] that institutions include all necessary explanatory information that colleges, employers, recruiters, and others will need to interpret and fully understand the transcript."

Suggestions for Development of Proficiency-based High School Transcripts

The admissions officers interviewed for this study from various colleges and universities across the state offered suggestions for ways to facilitate the use and interpretation of proficiency-based transcripts in the college admissions process.

First, **admissions staff praised the proactive efforts of several school districts and secondary institutions around the state for reaching out to college and university admissions offices to talk about their plans for implementing proficiency-based transcripts**. This effort to open lines of communication was said to help K-12 school districts understand what information admissions officers needed to see on transcripts and helped admissions offices better anticipate what kinds of information high schools would be sending to describe their students' work. Admissions officers reported that their staff routinely communicated with and visited secondary institutions around the state, and they welcomed contact from secondary institutions. A comment to this effect was the following: "Just call the admissions office if you have questions. Communicate with them. Let them look over a sample transcript document and provide explanation of the proficiency levels."

This importance of sharing information to explain the high school's method of reporting proficiency ratings was the most-often mentioned suggestion in our interviews. To accomplish this, admissions officers suggested that secondary institutions provide, at a minimum:

1) Clear, concise definitions or explanations of proficiency scores or ratings;
2) A comparable conversion from the proficiency scoring scale to a 4.0 GPA scale;

3) A school profile that outlines the school curriculum and available pathways for meeting graduation requirements;
4) Documentation of the courses--subject area and level of rigor--successfully completed by the applicant;
5) Information to compare the applicant's selected program of study and accomplishments to that of other students in the high school.

Taken as a whole, participants in this study indicated they wanted secondary schools to **make it easier for college admissions officers to find relevant information on the transcripts, but also to provide enough information explaining any non-traditional components of the transcript and student scores**. Participants said:

- "Conversion to GPA has been helpful."
- "A quick and clear snapshot is best, in addition to extra information. Too much information without explanation could hurt a student's review."
- "The more information we have the better decision we can make. The more information on the evaluation scale and what those proficiency ratings mean the better. How many students are reaching proficiency in the school? How many are taking rigorous courses, etc.? **We need to understand if students are going above and beyond basic proficiency**."

College admissions officers in this study **suggested that public school districts across Maine collaborate in order to adopt more consistent approaches and effective models of proficiency-based transcripts** when possible. A college admissions participant said, "The amount of anxiety on this is intense...Every school feels like they are taking this on alone, and they should be talking to one another." While most of the college admissions officers in this study indicated a willingness to be flexible and work with the transcripts they received, they nonetheless acknowledged that it would greatly facilitate the process if there was not such wide variation in districts' approaches to transcripts.

Finally, college admissions officers indicated they were hearing more and more from concerned parents and guidance officers, who were asking how the proficiency-based transcripts would be received and accepted by colleges and universities. A college admission officer said,

It would be helpful to have information we can share with parents about these changes and how it may or may not affect admissions decisions. We would also like information on how this has worked at other institutions that are reviewing these applications, as well as in other states.

The college personnel said they were trying to reassure secondary institutions, parents, and students that they were working with the new transcripts and would continue to review them, but they indicated that they would also encourage school districts to develop their own communication with parents about proficiency-based transcripts.

Conclusions

To date, colleges represented in this study reported seeing relatively low numbers of college admissions applications that included a proficiency-based system for reporting student academic work on high school transcripts. College admissions officials interviewed for this study indicated that they were accommodating secondary schools that are currently using these proficiency-based high school transcripts and working with high schools to generate information needed for review of applications. However, they also voiced strong concerns about the high variation in different formats of high school transcripts and information they received regarding students' achievement and academic work. They were concerned about the extra time and information needed to interpret some of these transcripts. In addition, many scholarship programs and NCAA eligibility requirements still mandated that students' GPA was reported on a 4.0 scale, which may or may not be included with proficiency-based transcripts. Overall, participants' comments in this study suggested that they would not be prepared to deal with high numbers of proficiency-based transcripts, especially those lacking a conversion to a 4.0 GPA scale, in the near future.

College admissions personnel indicated that public PK-12 school districts in Maine appeared to be using many different approaches to proficiency-based reporting. Parents and high school professionals had reportedly indicated to colleges that they were uncertain about what information is needed for appropriate and manageable materials and format in the college application. Greater collaboration across Maine's school districts was suggested in order to reduce variation in transcript models in use and to make sure sufficient information about a student's academic record and a school's curriculum were included in the student's application for college admission. Further, parents and students have voiced concerns and anxiety about how

proficiency-based transcripts would be understood and utilized by colleges. Participants suggested that information about proficiency-based diplomas and college admissions processes/requirements should be clearly and thoroughly communicated to parents, students, and other public groups to reassure stakeholders that colleges will continue to accept non-traditional transcripts and applications while clarifying mandatory reporting information that must be included to be eligible for certain programs, degrees or awards.

Review of Literature (Part II - Career Access)

The ultimate goal of PK-12 education is to apply learning to ongoing endeavors in adulthood that contribute to improving oneself, the community and the world. Numerous pathways offer opportunities for that application: professional work, continued education, parenthood, volunteer work, artistic expression, travel, and more. Many individuals explore the pathway of a professional career, through necessity of financial earning or intellectual pursuit or both. Understanding the essential elements that contribute to a successful career is a combination of intrinsic and extrinsic characteristics (Gattiker & Larwood, 1988) matching personal interests, skills and dispositions with a sustainable work environment that can provide financial stability as well as individual fulfillment while contributing to the profession or greater good (Arthur, Khapova & Wilderom, 2005; Judge et al., 1999). Being ready for this professional endeavor and having the opportunity to access such pathways are two key components of career success (Ng et al., 2005; Seibert & Kraimer, 2001), which also involve numerous factors related to social norms, family expectations, educational experiences, community contexts, and more. In this way, defining career readiness and understanding factors contributing to career access are a complex, interwoven enterprise. However, some common characteristics of high quality workers and expected workplace skills or dispositions are shared among employers, business leaders as well as researchers and educators.

Role of Postsecondary Education in Determining Career Readiness

This section of the report focuses on examination of access to careers at entry level positions, which may or may not require a high school diploma. However, the vast majority of research literature regarding career readiness identifies postsecondary education experiences or degree attainment as a prerequisite to career. In fact, many of the definitions of "college and

career readiness" in literature describe college course pathways, majors or degree type with minimal reference to attributes of career readiness applicable to workers with a high school diploma or less. Therefore, we include a brief subsection here to examine research and data that may contribute to this emphasis on the inclusion of college experiences in the definitions of career readiness evident within literature.

Determining if an individual is truly ready for his/her chosen career includes many factors, such as the occupation, position level, financial obligations, personal interests and more. However, holistic definitions of a "career-ready" workforce can highlight essential skills, dispositions or knowledge that may be prerequisites for entering certain professions or accessing specific jobs. Many education and business organizations have engaged in efforts to communicate the critical components for postsecondary readiness with conceptual definitions that combine college readiness and career readiness (e.g. Achieve, ACT, College Board, Lumina Foundation, Council of Chief State School Officers, Educate Maine, Envision Maine and others). This work underscores the related nature of career readiness and postsecondary education.

Individuals with a postsecondary degree earn between $442,000 (Associate's Degree) and $1.5 million (Bachelor's Degree) more in wages throughout their lifespan than their peers with only a high school diploma (U.S. Census, 2011). It is predicted that 63 percent of jobs in the U.S. will require a postsecondary degree or certification by 2018 (Bureau of Labor Statistics, 2013). "Postsecondary education has become the preferred and the most effective economic leveler, serving as an engine for mobility," (Carnevale & Strohl, 2010, p.72). Schooling has also been found to correlate with national economic returns: Hanushek and Woessmann (2008) indicate that "each additional year of schooling increased the average [Gross Domestic Product] growth rate by about 0.37%" (Mattern et al., 2014). Such statistics have influenced the most common current definitions of career readiness to identify a college degree as a critical precursor to lifelong career success.

Numerous professional pathways require postsecondary degrees or certifications to even be eligible for application, so access to careers and occupations that offer longer-term stability, family living wage and professional opportunity often reflect this prerequisite of college readiness and completion. Extending the view of career readiness to successful professional work throughout a lifetime is critically important to understanding the value of a living wage, sustainable employment and financial planning in later life. For example, an unmarried high

school graduate with no children may consider full-time work at $9/hour (approximately $19,000/year) a solid opportunity. However, a living wage for a family in Maine of two adults and two children would require both adults to work full-time at no less than $15/hour (Nadeau, 2015), and without a postsecondary degree or industry credentials to increase opportunities for career advancement, that would be a difficult achievement in many occupations.

Defining Career Readiness

The National Association of Colleges and Employers (2016) defines career readiness as "the attainment and demonstration of requisite competencies that broadly prepare college graduates for a successful transition into the workplace." Despite the stated importance of a postsecondary credential, it is suggested that simply increasing college completion rates may not fully prepare America's workforce for the country's future jobs. Surveys of U.S. employers indicated that even college-educated entry-level employees were sometimes seen as underprepared, and companies reported experiencing difficulties filling open positions with qualified workers, even when considering applicants with a college degree (Deloitte & Manufacturing Institute, 2011; Hart Research Associates, 2010; Manyika et al., 2011). Leaders of professional organizations noted that technical knowledge in certain target areas was needed to be eligible for specific occupations as well as general skills in communication, teamwork, persistent work ethic, and adaptability as critical qualities of individuals in a successful workforce, with or without postsecondary credentials (ACT, 2013; Carnevale, 2013).

Economies, industrial practices, environmental changes and social trends can contribute to the variability of supply and demand in the workforce. So, some occupations may offer many employment options one year and then very few opportunities two decades later, further complicating the definitions of career readiness. Maine's sea urchin industry is a perfect example of this uncertainty. The commercial sea urchin haul peaked in 1993 at 41.6 million pounds; in 1994, 2,725 commercial licenses to drag, dive or rake sea urchins were held; in 1995, sea urchin harvest landings were valued at $35.6 million (Maine Department of Marine Resources, 2016). A single boat's haul could exceed $10,000 per day. But the urchin harvest was not sustainable at this rate, and regulations as well as supply changes have severely reduced the industry. In 2015, 61 licenses were held, and the season was limited to approximately 30 days per year. The most recent annual haul (2015) was 1.5 million pounds at a value of $4.3 million (Maine Department of Marine Resources, 2016). Many highly qualified professional urchin divers earning a

significant annual income at age twenty in 1994 would have to diversify their skills to stay employed in the fishing industry at age forty. As such, career adaptability has become an essential element of readiness in current professional and economic environments (Nota et al., 2014; Tolentino et al., 2014) that are responding to changing variables such as technological advancements in manufacturing, environmental fluctuations in agriculture and consumer demands in retail sales.

Across trades, occupations and career readiness definitions, recent research has suggested that many characteristics of high quality workers lie within the realm of social emotional learning or "noncognitive" skills, such as self-awareness and regulation, building and maintaining positive relationships with others, and making responsible decisions (Durlak et al., 2011). Carnevale (2013) describes job readiness as including "a complex set of competencies that are not reflected in academic credentials and not nurtured through academic pedagogy" (p.6). One such commonly raised component of career readiness relates to the ability to collaborate with peers and work in a team-oriented environment (Makki et al., 2015; Sampson, Marriot & Hooley, 2016). Employers described their workplace as an integrated "team setting" requiring high levels of cooperation, social aptitude, responsible work ethic and strong communication skills (Carnevale, 2013; Turner & Danridge, 2014). It is observed in research that college graduates more frequently display these attributes than workers with only a high school degree (Cameron & Heckman, 1993; Pascarella & Terenzini, 2005). This finding could be interpreted as correlational, not causal, potentially meaning that people with these attributes are more likely to attend college, but not that they necessarily learn these skills in college. However these skills are acquired, it is evident both from empirical research and national literature that current-day employers are indicating that they need more adaptable, reliable workers to contribute in their professional team settings.

Maine's Labor Market and Workforce

National economic and job market trends are often reflected at the state level as well. It has been well documented that Maine's current workforce, similar to the nation at large, is aging rapidly (Hecker & Gugliucci, 2015; Miltiades & Kaye, 2003; Timmons et al., 2011). An added challenge in Maine is that the number of workers age 16 to 24 is also in significant decline, even though many older workers are delaying retirement and remaining within the workforce (Colgan, 2006). With changes and necessary adaptability within current and future occupations mentioned

above, there can be added pressure on present older workers and prospective younger workers to have a wider and more flexible set of career skills or engage in ongoing training, further complicating the definition of "career ready."

In addition to the aging workforce, some traditional occupations are showing decline in terms of job opportunity (negative percent change in openings in 2014), such as manufacturing (apparel, textile, paper, plastic, computer, machinery, food and others), logging, merchant wholesalers, fishing and government positions. There are also several industries now commonly identified in Maine as high growth, representing increased recent job openings, such as education, health care and services, chemical manufacturing, construction and engineering as well as hospitality. These shifts in industry job openings can have substantial effects on employment opportunities and the job market as a whole.

It is essential for communities, job applicants and other stakeholders to understand the specific characteristics of these data trends to guide their career preparation. "Nursing" is often cited as an occupation or industry in Maine that needs workers and is growing. In labor statistics, the Health Care and Social Assistance sector includes establishments providing medical care, health care and social assistance by trained professionals (North American Industry Classification System, 2016). Within this sector, industry groups that are represented include social assistance, hospitals, nursing and residential care facilities and ambulatory health care services. Examining the Maine Department of Labor's (MDOL) data, each of these industry groups had an increase in employment positions from 2013 to 2014, ranging from 5 to 14 percent (see Table 3 below).

Table 3. Health Care and Social Assistance Employment, by Industry Group (MDOL, 2014)

Industry Group: Health Care and Social Assistance	**2014 Employment**	**Net Change 2013 to 2014**	**Percent Change 2013 to 2014**	**Projected 2024 Employment**
Social Assistance	18,100	+873	5%	18,973
Hospitals	32,790	+2,310	7%	35,100
Nursing and Residential Care Facilities	23,108	+1,942	8%	25,050
Ambulatory Health Care Services	27,072	+3,728	14%	30,800
Total	*101,070*	*+8,853*	*9%*	*109,923*

Maine's increase of almost 2,000 positions in nursing and residential care facilities included six occupational titles designated as "nurse" or "nursing" and represented 905 job openings in 2014 (see Table 4 below). Again, all of these positions required at least a post-secondary certification with 63 percent of the openings requiring a Bachelor's or Master's degree. It is also noteworthy that there is a direct, positive correlation between education requirement level and average hourly wage. As well, it is significant to remember that living wage calculations for a family of four living in Maine required two adults to be earning at least $15/hour, while the Nursing Assistant occupation average hourly wage is $12.12/hour. (See Appendix D - Table A for a full list of Health Care and Social Assistance Industry Occupation Titles Employment data.)

Table 4. Nursing Occupation Employment (MDOL, 2014)

Education and Health Services Nursing Occupation Title	2014 Annual Total Openings	% Change Annual Openings 2013 to 2014	Typical Education Requirement	2014 Average Hourly Wage
Nursing Assistants	291	+ 9%	Postsecondary non-degree award	$12.12
Licensed Practical Nurses or Licensed Vocational Nurses	44	+ 5%	Postsecondary non-degree award	$20.39
Registered Nurses	505	+ 11%	Bachelor's Degree	$30.92
Nurse Practitioners	57	+ 25%	Master's Degree	$46.44
Nurse Midwives	1	+ 10%	Master's Degree	$45.76
Nurse Anesthetists	7	+ 7%	Master's Degree	$80.49

This analysis of labor statistics focused on Maine's job market in the area of "Nursing" confirms that the health care sector is one of the most rapid and consistent producers of jobs in the state (Leparulo, 2014). However, the vast majority of these nursing occupations require postsecondary certification, and many nursing jobs require at least a Bachelor's degree. In addition, some of the occupations with lower education requirements do not offer an average wage as high as a calculated living wage for a family in Maine. Meanwhile, other industries demonstrating at least a 5 percent positive change in total job openings in Maine in 2015 included Leisure and

Hospitality, Financial Activities (securities, contracts & investments), Transportation Support Activities, Chemical Manufacturing, Waste Services, Education, Professional and Business Services as well as Scientific and Technical Services. (See Appendix D - Table B for list of Job Titles with more than 50 openings in 2014 and Table C for list of 2014 Detailed Industry Employment and Change data.)

Role of Proficiency-based Education in Career Readiness

Maine's original proficiency-based diploma law reinforced its intent as a means to improve the state's workforce even in its title, *An Act to Prepare Maine People for the Future Economy*. Efforts to pass the legislation in addition to prior work developing academic standards and guiding principles in the *Maine Learning Results* were supported diligently by the state's business organizations and company leaders. Regional education organizations advocating for development of proficiency-based or competency-based or mastery-based approaches and reforms in schools also represented these efforts as a way to increase college and career readiness in high school graduates. A CompetencyWorks issue brief stated, "Many competency models include opportunities for students to take college courses, participate in internships, and find employment as part of a process of applying their skills in real-world settings, as well as learning to navigate new environments" (Shubilla & Sturgis, 2012, p.15). Nellie Mae Education Foundation (2015) stated, "Achieving universal college and career readiness is possible through the adoption and implementation of ... student-centered environments, learning is personalized, competency- based, takes place anytime, anywhere, and students take ownership over their learning" and has supported this approach with $200 million in investments in New England learners and communities reflecting these goals.

Again, it is important to note that many organizations' messages and research findings discuss readiness as a combination of experiences in college and career. Distinct exploration of career readiness and access, especially relating exclusively to workers holding only a high school degree or less, is an area with very minimal state or national literature. In addition, there is a limited although emerging pool of empirical research examining proficiency-based education with relation to student achievement at the secondary level since the general field of research investigating proficiency-based, competency-based or mastery-based graduation requirements and educational approaches is relatively new. This research field is also challenged by varying operational definitions and implementation strategies in practice, which makes it difficult to

identify common or causal findings (Hawes, 2015; Torres, Brett & Cox, 2015). Unfortunately, there is currently no evident rigorous, empirical research exploring the success of graduates from high schools implementing proficiency-based education into their postsecondary career experiences.

Methodology (Part II - Career Access)

The fifth phase of this ongoing research includes a series of studies examining the impacts of implementing proficiency-based diploma systems within the immediate and wider contexts of public schooling in Maine. This Phase V report includes research exploring implications of proficiency-based diploma policy as it relates to college and career access. Part II of this report shares information from investigation of the implications of Maine's proficiency-based high school diploma policy for access and eligibility to postsecondary career opportunities and was guided by the following research questions:

1. How do persons representing Maine's leading businesses and professional organizations perceive the state law mandating proficiency-based high school diplomas as it relates to improving Maine's workforce?
2. What are required education degrees, skills and dispositions for entry-level general employment in Maine's leading careers?
3. What are preferred degrees, skills and dispositions necessary for career advancement in Maine's leading businesses and professions?

Sample

During the fall of 2016, MEPRI researchers from the University of Southern Maine conducted document review and qualitative interviews with adult individuals and focus groups representing businesses and professional organizations in Maine. The interview sample for this study included ten individuals representing six professional businesses or organizations within various employment industries, including Construction and Contracting, Manufacturing (including Paper and Apparel), Agriculture (Fishing), and Retail as well as the U.S. Army National Guard. Professionals included laborers, administrators, executives, human resources personnel, recruiting officers and owner-operators of national corporations, independent small-businesses, Maine-based companies and professional organizations. All participants voluntarily

participated in this study. In addition, publicly-available videos and professional recruiting documents were reviewed from four organizations. Because only a few organizations agreed to be named or acknowledged, no participants or participating organizations were named in this report in order to maintain confidentiality.

Data Collection & Analysis

First, a literature review of local, national and international research was conducted to identify key definitions of "career readiness" and examine relevant trends in U.S.' and Maine's current workforce. Then, recent public data from the Maine Department of Labor was analyzed to identify industries and professions with higher growth rate, higher pay and increased openings. Following the exploration of this data and literature, interview protocols (see Appendix C) were developed to address the following topics:

- Prerequisite skills and dispositions expected by employers from high school graduates.
- Employment opportunities for applicants without a high school diploma.
- Education degree requirements and preferred attributes for career advancement.
- Skills, dispositions and knowledge in high quality applicants and employees as perceived by employers.
- Perceptions of the proficiency-based high school diploma system policy in Maine.

Participants were recruited from several of Maine's top employers and professional industries. Interviews were then conducted either in-person or via telephone with individuals and focus groups of representatives from six organizations.

As part of the review of public documents, researchers examined materials from recruiting videos and company websites of ten professional organizations and businesses in Maine, including organizations with interview participants as well as three additional organizations.

Researcher notes were compiled and analyzed to identify emergent themes in the empirical data collected and reviewed, then compared to trends in the Maine workforce data as well as patterns highlighted in national literature. The MEPRI research team established key areas of focus as well as significant findings that were unique or divergent. These findings regarding implications of proficiency-based diploma policy within the contexts of career access, eligibility and readiness are discussed in this report in the section below.

Findings (Part II - Career Access)

Examination of workforce data, public documents as well as perceptions and information shared in qualitative interviews revealed common themes regarding access to entry-level employment and career advancement opportunities within Maine's leading industries. This study focused on **eligibility for entry-level employment** instead of professional positions requiring advanced degrees, such as engineers, physicians or nurses. Sometimes, these entry-level openings were called "floor-level" (referring to labor positions in a manufacturing production floor or retail sales floor) or "general labor," so this report will use the term "general level" to identify such job pathways.

While many industries in this study did not officially require a high school diploma for general level employment, most participants agreed that this credential was beneficial and became more critical in tighter job markets. Representatives from the organizations represented in this study said that they **expected high school graduates to demonstrate basic literacy in reading, writing, mathematics and technology** regardless of their position or field of interest. Some professionals said they had seen applicants who were Maine high school graduates but did not exhibit these qualifications, thereby raising the issue of a common minimum standard for earning a high school diploma across all school districts in the state. High quality general level workers across various industries were described as **dependable, attentive, compliant, flexible and team-oriented**. Career advancement to higher paid or leadership positions commonly included demonstration of **dedication** to the organization or profession through consistent high quality work over a few years or more, then progressing by earning a postsecondary degree or further training and being **adaptable to the market and changing leadership**.

While most participants in this study said they had very limited exposure in their professional role to Maine's education policy requiring the implementation of proficiency-based high school diploma systems, some people we spoke to were aware of the implementation efforts of their local school district. Interviewees generally agreed that a high school diploma should only be earned if a student could demonstrate proficiency in basic reading, writing, mathematics and technology. However, many professionals in this study also suggested that Maine's workforce needed increased **(a) understanding of systems and structures of local, national and international economies, (b) communication and trade skills to be an industry advocate, and (c) adaptable, diverse skill sets to remain relevant in the changing work**

environments of contemporary society. Further discussion of the themes and findings from this study are explored in the subsections below.

Minimum Requirements for Entry-level Employment

The basic qualifications required for employment in the industries included in this study were rather diverse and often dependent upon the specific trade or current job markets. Participants indicated that a high school diploma was not a formal prerequisite for being hired in many general level positions in their organization or business. However, it was noted that most successful applicants did have a high school degree or had earned a passing score on the General Education Development (GED) test. One professional recruiter said, "If the labor market is tight, education degrees make the applicant more competitive." A lobsterman said,

> A kid doesn't need a degree to be on my boat, but **a kid who graduates from high school has shown me something. He's shown me he can work hard, put in the time even when it's not exactly what he wants to do.** If he made it through high school even when he wants to be on a boat every day, it shows me he's reliable even when it's not so great out here.

A military representative said, "If you can't make it through the tough parts of high school, you probably aren't going to make it through the tough parts of the military or make a good soldier." Participants from the paper manufacturing company did indicate that a high school diploma was required for employment in their mill. In addition, high school students who are juniors or seniors and at least 17-years-old may enlist and engage in drill in the U.S. Army National Guard but "cannot begin [Advanced Individual Training] or ship without a degree."

Common skills as measured by various standardized assessments were identified by participants as necessary for being hired or entry-level training processes in some areas. Certain organizations required a minimum score on an external aptitude test or technical license exam to be eligible for employment. For example, the U.S. Army mandated a minimum score of 31 on the Armed Services Vocational Aptitude Battery (ASVAB) and used the test to determine Military Occupational Specialty and eligibility for select military schools or enlistment bonuses. Eligibility for enlistment in other branches of the U.S. military and Coast Guard required higher scores. In another example, one manufacturing company required a mechanical aptitude test, an in-person interview and a half-day training with other applicants "to be sure they can follow safety instructions and take direction" for general employment "on the floor." Another

manufacturing company described their mandatory 8-12 week, standardized entry-training program for all new hires. Several representatives indicated that their applications had online components or video training modules to be completed prior to hiring that necessitated applicants to have basic computer navigation skills. Retailers often required employees in general level positions to learn standard practices using industry technologies (e.g., scanning tools, inventory instruments, etc.) while memorizing products and product placement in the stores and warehouses. A retail representative said, "It's not that we don't want critical thinking, but we must have standardized learning...the ability to **learn common information using our industry-standardized training tools and technologies**."

Safety was cited as a key reason for the need to comply with training protocols and standardized procedures in many of the general level positions: "If you follow the policies, there's a better chance you'll go home in one piece." Although, it was also noted that some situations needed "quick thinking to resolve the matter at hand." Participants applauded employees who could "problem-solve and troubleshoot on their own, that can take direction but also use their initiative when necessary." An administrator in manufacturing said, "Our machinists need to make fast calculations in their head all the time. If something doesn't look right or isn't working properly, it's a quick decision by a skilled team member that can prevent an accident from happening or keep production rolling."

Some participants indicated that they had seen recent applicants who could not demonstrate basic proficiency in reading, writing, computer or mathematics skills. A Maine-based company representative noted, "**A diploma should be a mark of credentialing for basic literacy in reading, technology use and math**. But, we have seen high school graduates in our applicant pool without these skills." In fact, one Maine employer said, "People with a GED often come in at high levels as far as reading, writing and aptitude than high school graduates." Another human resources staffing professional indicated,

> It's hard sometimes to know whether a graduate has the needed skills or if he just sweet-talked his way through high school. With a standardized test, like [ASVAB or GED] you know their skills in a certain professional area, not just how well they can convince a teacher to give them a passing grade.

Therefore, several employers in this study indicated that they used their own internal aptitude tests or an external trade skills assessment as a requisite component of hiring applicants, even applicants who had a high school diploma.

In addition, certain technical or higher-skilled entry-level positions required advanced degrees or licensure. A construction contracting professional said,

> Some trades require applied use of trigonometry and calculus. Pipe fitters, for example, are using rolling offsets [to compute the length of an angled pipe segment needed to connect two pipes], so they must understand the formulas to do those calculations. Licenses issued by Maine's [Professional and Financial Regulation] Board require them to demonstrate those skills.

Similarly, the paper manufacturing mill representatives participating in this study indicated that their corporation only hired persons with engineering or finance college degrees for positions in those departments. In addition, one of Maine's largest retail employers shared that their corporate, full-time positions required a college degree and approximately 90 percent of their permanent employees had a college degree, even people working in-store sales.

Preferred Skills & Dispositions of a Maine Workforce

Although some positions or corporations preferred new-hires with experience in the trade or type of work, many participants in this study described **a successful worker as "dependable," "reliable," and "trustworthy" with a good attitude and strong work ethic**. A national chain corporation representative said, "Our people have to reflect the values of [the company] and represent the [company's] vision." A Maine-based company representative echoed this: "We love those committed people."

A common critical characteristic was a worker who "showed up on time" and had a devotion to the work. A fisherman said,

> I've got thirty weeks to haul. These are eighteen to thirty-six hour days. I need my guys to be on the boat when we get ready to leave at 4 AM, no matter the weather, their health or what they did the night before.

A retired enlisted non-commissioned Army officer echoed that "there has to be some level of compliance, but somewhat self-motivated and self-disciplined." One participant said, "We need construction generalists who show aptitude in the trade, show up to work on time, don't leave every day for an issue on the job, don't sleep on the job, work hard, stay attentive." A retailer

said, "I want the kid who is excited to learn in this area, happy to come to work." And another participant shared, "Our **employees have energy and passion for the brand. They are not just putting in time; they have positive energy**."

Participants in this study also commonly identified a high quality worker as having the ability to be collaborative and "highly team-oriented." One retail organization leader said,

> I worked at smaller businesses and there isn't this sense of being part of something bigger. I mean you can't just do things your way here. There is a [company] way, and you got to believe in that. Some people don't, and that's fine. They probably go off and run their own business. But here, you build a team instead of just working for a boss.

A construction contracting company representative said, "You have to align well with the core values of the organization and corporate goals as well as work well with your peers." One participant who worked as a Human Resources administrator referred to her child's school experience with an approach to proficiency-based education that included more "personalized" and "customized" learning,

> In [this company] it's not like that. **We want workers who are more team-based and less individualized**. There are company standards that are not personalized. We don't want you working at your own pace. You have to bring along your team. I see a real need for more development of team work in applicants these days, not so much a need to personalize more.

Another professional recruiter said, "We are highly team-oriented and collaborative. That trait is very important to use in a hire: people who play well with others, who **go beyond their individual work to help others, not just think about their own advancement**."

Prioritized Criteria for Career Advancement

While certain pathways and professional positions required an advanced degree or specific trade training, several employers shared the value of a worker who grew and adapted to the needs of the organization: "We want [employees] to have a **willingness to learn, retool yourself as needed**. If you're a visual learner, you may need to take on something else that is outside that area of expertise or comfort." A representative from a construction contracting company said,

> Our business has become diversified to stay alive. When one market is hot, another market is not. Historically, we have looked at diversity to maintain the work for our team

> members. That's where their can-do attitude, willingness to learn and take on the challenge comes in.

Some workers were valued for having a broad skill set upon being hired, but many employers described opportunities for employees to train on-the-job. Some companies had standardized online, self-paced career area training modules and leadership courses available to all employees. An employee in one organization said, "There are a lot of trade skills to learn in-house. They get you to that spot with training." One administrator explained,

> There are different avenues for pathway expertise or leadership, some are within the trade others are supplemental to the work day. It can be a mixture of classroom, computer and video. You have to be self-motivated but the opportunity is there.

Several organizations had opportunities for high school and college students to intern or participate in summer trainings. Some companies had specific programs within local vocational high schools to introduce related trade skills.

In recent challenging economic times as well as changing environments that have affected agricultural industries in Maine, leaders in many professional occupations emphasized the need for a diversified workforce that could grow with the organization. One participant said, "We are undergoing change at our executive level. There is a business transformation initiative and a lot of evolving here. So, we look for people willing and able to roll with that change." A representative of the fishing industry reiterated this need:

> A huge percentage of the people in the fishing industry don't have any other skills. If...When the industry collapses--parts of it already have--where do they go? There are more and more limited 'water opportunities.' We need more varied skills: sales, biology, business.

A lobsterman also echoed, "**Fishing isn't just about going out there and working as hard as you can...you have to understand budgets and accounting to sustain it. A business person is what you are as a fisherman**." Another fisherman shared his perception of the role of schooling in preparing people for the future of the industry:

> I've seen [schools] give kids a diploma for spending hours on a boat. I don't need a degree to tell me if a guy can work my boat, I know that by working with him. What I want school to give him is better math, better financing for knowing how to deal with unpredictable paychecks, better understanding of the science behind the catch limits and

stock assessments we get, communication skills for marketing our catch, talking skills for convincing those folks up in Augusta to do what's good for the fishermen, what will keep the work going.

A representative from the paper production industry also indicated that there were changes in common procedure and the expectations of laborers: "There are fewer supervisors in our mill now, for efficiency. Our laborers need to be more independent, taking care, more responsible." Other personnel from the paper production company also shared a belief that all workers, even general level workers, should have an improved understanding of the industry as a whole. They suggested that high school students learn more about "the **concept of where products start out, supply chain and how the national and global economies work.**" Another corporate leader said, "Yes, we'd like more high school graduates with a better understanding of supply and demand, an introduction to economics."

It was suggested in the interviews for this study that a more holistic command of organizational systems, economics and team leadership was a distinguishing characteristic of applicants and workers qualified for career advancement. "In corporate, we hire college graduates usually because they have had experience thinking about the larger systems--how things work beyond this mill--to make us more relevant in the larger economy. That is becoming a key to our survival." Another company leader said, "It's also about accountability, the ability to say 'I made a mistake'...while not making too many mistakes." Participants in a few organizations suggested that they believed college graduates had more general awareness of critical elements of the trade or profession than non-college graduates, so they "are not afraid to suggest an idea even if it may fail, and when it does fail, it's usually on a smaller scale that can be revisited and improved, not something that endangers people or causes great malfunction." It was indicated that having general level workers and leaders with a comprehensive perspective of company productivity, efficiency and quality contributed to their organizations' well-being.

In some cases, workers could advance within an organization without external credentials or degrees, but it was stated that this was becoming less common. "If they receive endorsement from a supervisor, have a review of work history for consistent behavior and demonstrate extraordinary ability to lead a team, they can be recommended for leadership positions." In the current job market, participants reported that they "see many applicants coming in the door with

these skills and experience or have moved through our training program as they earn their [Bachelor's or Master's] degree in the field."

However, a common pathway to earning positions of leadership--either in general management or possibly corporate administration--was described with similar components. One manager said,

> First, you need to demonstrate reliability in the position you have, adherence to safety regulations, understanding of the [company] way of doing things, contribution to your team. Then, you can use your trainings to help you generate some creative ideas...be innovative about how you use the things you learn.

Another participant continued, "That's where the can-do attitude and willingness to learn helps. You're not on your own. There are pathways for advancement, but it's a team thing, not individual." A U.S. Army representative said,

> You have to apply yourself. If your evaluations are not where they need to be, you can be sent home. It is competitive placement: can you learn new skills? You need to take the incentive to improve yourself. You don't just advance through years of service. You can't retire if you don't make E6 [Staff Sergeant rank]. They want to see you advance. You can be a follower, but at some point you have to take leadership.

A corporate leader reiterated this need for initiative: "Learn your job and what it entails. Put in your time well. Then, you take it to the next level." A local company administrator described her organization's course of advancement:

> Every new hire goes through a process to learn about the history of the company. Every team member must earn the stripes and build credibility. Then, there is **intellectual curiosity** in the corporate side. Come with an idea, but it needs to make sense and have a plan if it doesn't work. Dig deeper and learn with a balance of analytical and data driven going hand-in-hand with innovation. **If your ideas continue to improve the team, the organization and align with corporate goals, you're going to advance.**

Perceptions of Maine's Proficiency-based Diploma Systems

While most participants in this study were not directly familiar with Maine's proficiency-based high school diploma policy, there were common themes among the findings related to the state mandate. Leaders from Maine businesses and industries commonly believed a high school diploma should be a credential that consistently represented certain skills--such as basic literacy

in reading, writing, mathematics and technology--as well as a strong work ethic. Therefore, it appeared that the premise of a standards-based education system and a proficiency-based high school diploma as a demonstration of minimum knowledge, skills and dispositions was generally supported by participants in this study. However, as one organization leader said, "Different standards between districts or different definitions of proficiency negates the meaning of that common diploma credential."

Additionally, people interviewed for this study reflected a lack of confidence that implementation of a proficiency-based diploma system would raise the bar for graduation statewide or ensure students could demonstrate minimum skills. One participant with experience working in Maine public schools said, "The philosophy of proficiency-based diplomas would address this with content area standards and the guiding principles, yet we are constantly asked to make it individually work for each kid. Usually that's a lack of work habit, inability to persist." Another participant echoed this perception:

> Anticipating the next task and taking initiative to do it instead of waiting to be guided every step of the way is what we need in Maine's workforce. That seems hard to assess in a proficiency-based system. It is habits of work, which seems to be less valued.

A leader expressed concern,

> We don't let people not graduate. Focus on the school's graduation rates and dropout rates makes us work harder to get them to graduate. They may do what they need to do or not or just barely but we do a lot to pull them along. I'm not sure in the workplace if we have helped them by doing that or set them up for failure.

Another participant worried that the approach in her local district was "lowering standards and enabling students so you can't blame the school for not having that diploma." Again, it should be noted that the beliefs of many participants in this study were based on their experience with one local school district or perceptions of implementation in their children's' schools. And, prior research confirmed that Maine's schools were taking various approaches to implementation and at different points of progressing to the required implementation levels for the graduating class of 2021 (Stump & Silvernail, 2014). However, the common perception of participants in this study was that the proficiency-based diploma policy had not changed the overall skill level and work ethic of high school graduates entering Maine's workforce. One participant said, "It is a system

like we have a system now. And one thing I do know is a lot of kids who know how to work the system."

Despite lack of familiarity regarding specifics of Maine's proficiency-based diploma policy and uncertainty about various school districts' interpretation of Maine's education policy and approaches to local implementation, the leaders from Maine's businesses and professional organizations who participated in this study reflected a vision for high school graduates and a successful Maine workforce that could align with key tenets of the proficiency-based state mandate. Employers from larger companies indicated that it would be valuable for a high school diploma to certify that a graduate has demonstrated skills and knowledge in essential subject areas. In this way, Maine's proficiency-based high school diploma policy requires school administrative units to award diplomas only to students demonstrating proficiency in eight specified content areas with recommended corresponding standards. Additionally, all professionals in this study recognized the importance of high school graduation as an indication of a certain work ethic as well as understanding of local and global economic systems. This aligns with the inclusion of the guiding principles within Maine's learning results system as a required component of demonstrating proficiency to earn a high school diploma under this law. However, the emphasis from employers from this study on collaboration and team-oriented work is not represented in the current knowledge and skills as described in the updated *Maine Learning Results* Guiding Principles (although a "quality and collaborative worker" was included in earlier versions of the Guiding Principles).

Conclusions

Practical alignment between Maine's proficiency-based diploma policy implementation and criteria noted in this study for access to career pathways did not seem to fully correspond. However, common themes revealed in this examination of career access did reflect elements of the original *Act to Prepare Maine People for the Future Economy* (2012) and most recent *Act to Implement Certain Recommendations of the Maine Proficiency Education Council* (2016). The 2016 law requires that school administrative units phase in high school diploma requirements that "certify that the student has engaged in educational experiences relating to English language arts, mathematics and science and technology in each year of the student's secondary schooling" and "certify that the student has demonstrated proficiency in meeting the state standards" in eight content areas beginning with English language arts, mathematics, science and technology and

social studies. This emphasis on standards in reading, writing, mathematics and technology was shared by participants in this study. In addition, both versions of the Maine law emphasized that students must demonstrate proficiency in certain skills and dispositions beyond content knowledge as reflected within "guiding principles." These guiding principles aligned with Maine business leaders' value placed in characteristics such as "effective communicator," "self-directed learner," "problem solver," as well as "integrative and informed thinker" with "global awareness and economic...literacy." Although business leaders in this study highlighted the importance of workers' ability to collaborate and work in "highly team-oriented" environments, that attribute is not reflected within the current Maine Department of Education's "Guiding Principles standards...developed in response to Public Law 669, Section 9" (MDOE, 2016) as "guiding principles set forth in department rules governing implementation of the system of learning results established pursuant to section 6209" (S.P. 660 - L.D. 1627).

Conclusions

This study examines the implementation of Maine's proficiency-based high school diploma policy as it relates to the immediate and wider contexts of schooling regarding postsecondary opportunities, specifically college and career access. In this way, Part I of this report shares existing research literature regarding college access and readiness as well as empirical data from document review and interviews with college admissions personnel. Part II of this report offers a review of research literature about career access and readiness as well as workforce trends and empirical data from qualitative interviews with leaders from businesses, professional organizations and the U.S. military.

Findings suggest that most college admissions, scholarship selection and athletic eligibility processes still heavily relied on traditional components, such as grade point average, standardized test scores, course selection and grades. Admissions officers indicated that a precise, informative school profile and clear transcript with proficiency levels defined and student information that could be compared to other applicants was important. Although participants in this study said they had not received many proficiency-based high school transcripts yet, they communicated that it would be critical to explain changes and felt proposed changes could be a "less reductive way of evaluating students." Representatives from Maine businesses and professional organizations described high quality entry-level job applicants as dependable and positive with a strong work ethic as well as being adaptable to changing markets or leaders. Employers said that they expected high school graduates to demonstrate a common level of basic literacy in reading, writing, mathematics and technology. Participants emphasized that most of their organizations or businesses needed employees with good collaboration skills in a team-oriented environment who could also understand economic systems as well as exhibit solid communication skills.

Both findings from this college and career access research indicated that most participants in this study had limited exposure in their professional work specifically related to Maine's proficiency-based education policy. There was some evidence from this study that current practices related to college admissions and entry-level career access were not fully aligned with some components of Maine's proficiency-based high school diploma policy. Both college and business representatives expressed concern about the variation across school districts

regarding methods and policies defining and reporting the achievements and requirements of a high school graduate; it was clear that common or comparable skills and communication of students' abilities were expected in both college admissions and job application processes. Both college and career personnel appeared to value an established skill base in core content areas; although local school districts' interpretation and high school graduation requirements varied, participants voiced support for having common content area standards adopted by the state. In addition, college admissions personnel and employers in this study evidently valued skills acquired through social-emotional learning, such as habits of work or mind reflecting a motivated learner as well as "working together, being kind."

Therefore, findings from this study can shed light on steps that may be taken to increase alignment of the expectations and eligibility requirements of college and career access with Maine's proficiency-based and standards-based policy. Some of these recommendations are shared in the following section of this report.

Recommendations

An Act to Implement Certain Recommendations of the Maine Proficiency Education Council (S.P. 660 - L.D. 1627) was passed into law as Chapter 489 amending the chaptered law *An Act to Prepare Maine People for the Future Economy* (S.P.439 - L.D.1422) passed in 2012 requiring Maine's public school districts to implement proficiency-based diplomas and standards-based education systems. Evidence from this study examined implications of this recent policy within key programs, contexts and populations. Literature review, document review and empirical qualitative interviews were conducted to examine the alignment of proficiency-based diploma systems and college eligibility and entry requirements as well as identify postsecondary career entry requirements and attributes of high quality workers.

Most participants in this study indicated that they had limited exposure to either the 2012 proficiency-based education policy or its recently-passed updates, therefore, they spoke more generally about college and employer expectations of high school graduates. It was clear from the evidence presented that the goals, standards, practices and policies involved in Maine's efforts to implement a proficiency-based high school diploma and standards-based education system were somewhat, but not fully aligned with components required for access to college and the workforce. Therefore, implementing the following recommendations may increase this alignment and help Maine's PK-12 students and schools as well as colleges and employers prepare for the shift to proficiency-based credentials and experiences for Maine high school graduates.

a) Review the *Maine Learning Results* and adopt revisions to the Guiding Principles that incorporate the characteristics of team-oriented practices or "working together," thus reflecting the priorities shared by Maine's colleges and employers.
b) Provide incentives and/or support for efforts to increase direct communication between high schools and postsecondary education institutions (colleges, universities, technical training centers, etc.). This may inform postsecondary institutions about any changes in student information relating to implementation of proficiency-based high school diploma systems and improve secondary schools' awareness of established institutional, state or federal requirements for student information to maintain eligibility for certain postsecondary programs, scholarships or opportunities.

c) Support continued research examining implications of proficiency-based education policy for postsecondary learning opportunities and high school graduates' career success to increase alignment between elements required for college and career access with Maine's proficiency-based high school diploma implementation and practices in PK-12 public schools.

d) Establish opportunities for dialogue and collaboration among Maine employers, PK-12 educators and education policymakers to inform stakeholders of expectations of career access as well as implications and clarification of Maine's proficiency-based education policy.

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Appendix A: College Access (Part I) Interview Protocol

Part 1: **Initial requirements for admissions to the institution**

- What are the minimum requirements for acceptance to an undergraduate program at your institution?
- How do these vary across the 5 programs of study?
- What are preferred credentials for acceptance?
    - How do these vary across the 5 programs of study?
- Of all the criteria you consider for admissions decisions, what are the most important? (2-3) What are next most important? (2-3)
    - Do these vary across the 5 programs? How?

Part 2: **Additional criteria for admissions to professional programs of study?**

- Are there any additional steps students must complete, minimum standards or scores, in order to a) be accepted into a professional program or b) enroll in the required courses?
- What was the institution-wide acceptance rate for undergraduate admissions for last year?

Part 3: **Experience with performance-based HS transcripts**

- What changes if any have you noticed in the past year or two in the HS transcripts you receive from Maine high schools as school districts transition to proficiency-based education and diplomas?
- What information on HS transcripts is most important in the admissions decision?
- As you review transcripts from high schools transitioning to proficiency-based education, do you have the type of information you need to make admissions decisions?
    - Do these transcripts include both letter grades for courses/ GPA and proficiency levels? Do you need both kinds of information? Other kinds of info?
- How do you interpret the proficiency levels from different high schools?
    - How do you use proficiency levels to indicate a student's readiness for college?
    - What other kinds of information do you need to interpret the scores? Example--different kinds of schools giving students the highest proficiency level. (e.g., school profile or other info needed?)
- Has the transition to proficiency-based education and transcripts had a negative impact on admissions decisions? Has it had a negative impact on acceptance into any of the 5 programs of study we've asked about?
- What challenges have you experienced with the proficiency-based transcripts recently?
- What other challenges do you foresee as more Maine high schools make this transition? [Note: state policy requires districts to implement prof-based diplomas for core subjects of math, science, social studies, English and Guiding Principles by 2020-21 (2021 graduating class), and full implementation across all subjects by 2025]

- What opportunities if any do you see with this transition to proficiency-based education and transcripts?
- Do you have suggestions for school districts related to the information provided on HS transcripts, school profiles, or other information submitted for college admissions?

- Other comments you'd like to share?

Appendix B: Post-Secondary Institution Admissions Criteria

University of Maine (Orono)						
Program	General - Undergraduate Admissions	Nursing	Business	Education	Engineering	English
Minimum GPA	2.5 GPA	3.0 GPA Overall 3.3 GPA in English, biology, chemistry, algebra, and geometry	2.5 GPA	2.5 GPA	3.0 GPA	2.5 GPA
Minimum SAT or ACT	980 SAT or 19 ACT	1170 SAT or 24 ACT	1080 SAT or 21 ACT	1080 SAT or 21 ACT	1170 SAT or 24 ACT	980 SAT or 19 ACT
Minimum HS Credits or Courses	4 years of English	4 years of English	4 years of English	4 years of English	4 years of English	4 years of English
	3 years of math (algebra 1, 2, and geometry)	3 years of math (algebra 1, 2, and geometry)	4 years math, one being senior level (Pre calc or calc)	3 years of math (algebra 1, 2, and geometry)	4 years math, one being senior level (Pre calc or calc)	3 years of math (algebra 1, 2, and geometry)
	2 years of lab science	2 years of lab science	2 years of lab science	2 years of lab science	2 years of lab science, one being physics	2 years of lab science
Preferred Courses	Advanced, honors, or AP coursework (i.e., courses at	Lab science. 3 years of science				

	college prep level or higher)					
	Computer science coursework					
	Fine arts coursework					
	2 years of world language					
Preferred Criteria	Extracurricular involvement				All grades “B” or higher and Top 20% of class	

University of Southern Maine						
Program	General - Undergraduate Admissions	Nursing	Business	Education	Engineering	English
Minimum GPA	2.67 GPA	3.0 GPA Overall	2.67 GPA	2.67 GPA	2.67 GPA	2.67 GPA
Minimum SAT or ACT	900 SAT, 19 ACT	1100 SAT(550 Reading 550 Math), 21 ACT	900 SAT, 19 ACT	900 SAT, 19 ACT	900 SAT, 19 ACT	900 SAT, 19 ACT
Minimum HS Credits or Courses	4 years of English	4 years of English	4 years of English	4 years of English	4 years of English	4 years of English

	3 years of math	3 years of math	3 years of math	3 years of math	3 years of math	3 years of math
	3 years of science	3 years of science	3 years of science	3 years of science	3 years of science	3 years of science
	2 years of social studies	2 years of social studies	2 years of social studies	2 years of social studies	2 years of social studies	2 years of social studies
Preferred Courses	College preparatory courses	3 or 4 years of lab science	College preparatory classes	College preparatory classes	Higher standardized math scores, will give more scrutiny to these scores	College preparatory classes
Preferred Criteria	Written essay (optional but recommended)					

Eastern Maine Community College						
Program	General - Undergraduate Admissions	Nursing	Business	Education	Engineering	English/ Liberal Studies
Minimum GPA	GPA—program specific Minimum preferred 2.0 - 2.5 for most programs	GPA 3.5 in college level courses				

Minimum SAT or ACT	Accuplacer placement test may be required if no SAT					
Minimum HS Credits or Courses	4 years of English	4 years English + college English 101	4 years English	4 years English	4 years English	4 years English
	Math--Algebra 1	Algebra 1	Algebra 1	Algebra 1	Algebra 1, 2, and Geometry	Algebra 1
	Science—program specific	Biology, chemistry lab courses, + college level anatomy and physiology, nursing dosage			Physics	
Preferred Courses	Additional math or science coursework		Algebra 2	Lab science course	Calculus 1 & Trigonometry	
Preferred Criteria	SAT					
	Letters of recommendation (required for healthcare programs)					
	Essay (required for 3 medical programs)					

Highly Selective Four-year Private Liberal Arts College	
Program	General - Undergraduate Admissions (Only Bachelor of Arts degree awarded with specific requirements for declared majors and minors.)
Minimum GPA	no req'd min; average GPA of admitted students = 3.80
Minimum SAT or ACT	SAT or ACT scores are optional, not required: Median-critical reading = 740 Median- math = 730 Median -writing = 730
Minimum HS courses or credits not required, but typical entering first-year student has completed four years of core courses	4 years of English
	4 years of a foreign language
	4 years of mathematics
	3-4 years of lab science
	4 years of social studies
Preferred Criteria	Counselor and teacher recommendations
	Personal Interview
	Rigorous course levels
	Writing samples
	School, community & extracurricular involvement

Four-year Private Business-oriented College					
Program	General - Undergraduate Admissions	Nursing	Business	Education	English
Minimum GPA	2.5 GPA	3.0 GPA	2.5 GPA	2.5 GPA	2.5 GPA
Minimum SAT or ACT	900-950 SAT or 19 ACT	1030 SAT or 21 ACT	900-950 SAT or 19 ACT	900-950 SAT or 19 ACT	900-950 SAT or 19 ACT
Minimum HS Credits or Courses	Defer to high school graduation requirements in all course/credit requirements	Defer to high school graduation requirements in all course/credit requirements	Defer to high school graduation requirements in all course/credit requirements	Defer to high school graduation requirements in all course/credit requirements	Defer to high school graduation requirements in all course/credit requirements
Preferred Courses	Advanced, honors, or AP coursework	Higher level science, physics	Advanced, honors, or AP coursework	Advanced, honors, or AP coursework	Advanced, honors, or AP coursework
		Higher level math, precalculus or calculus			
Preferred Criteria	All grades "B" or higher		All grades "B" or higher	All grades "B" or higher	All grades "B" or higher
	Internships	Internship in the health field	Internships	Internships	
	High school involvement	High school involvement	High school involvement	High school involvement	
	Extracurricular involvement	Extracurricular involvement	Extracurricular involvement	Extracurricular involvement	

Appendix C: Career Access (Part II) Interview Protocol

MAINE EMPLOYER INTERVIEW GUIDE / FOCUS GROUP PROTOCOL

Human Resources Personnel, Corporate Leaders, Company Executives, Recruitment Officers, etc.

Company/Organization Name:_____ Date: _____

Introduction: Thank you for your willingness to talk with me today. I am _____, a research associate working at CEPARE, an education policy research center at USM. We're here because the Education Committee of the state legislature commissioned a study to better understand implications of the mandated proficiency-based high school diploma systems as it relates to career eligibility and professional advancement requirements.

This study was commissioned by the Maine Legislature's Joint Standing Committee on Education and Cultural Affairs. The task of the study is to compile a fifth-year of data on the impacts of implementing a Proficiency-based Diploma System in Maine, as directed in LD 1422 and LD 1627, which require that high school/district students earn a proficiency-based (as opposed to time-based or credit-based) diploma. This policy mandates that, starting with the graduating class of 2021, all students in Maine public school districts must demonstrate proficiency in content standards and guiding principles to earn a high school diploma. (Some districts have already implemented this graduation requirement with the current students.) Findings of this study will be reported to the Education Committee early in 2017 and a public report of the study will be available the following summer. The purpose of the study is to document (NOT evaluate) some of the work being done in public school districts to implement Proficiency-based Diploma Systems in Maine and how it relates to workforce trends and opportunities. Previous reports are available at our website: usm.maine.edu/cepare

We're doing interviews with staff and leaders at several case study Maine businesses or professional organizations. The information from these interviews will be pulled together with other provided and public documents to get a sense of the requirements of some of Maine's top careers and eligibility for employment in some Maine businesses. Your participation is voluntary. This interview will only be used for the purposes of this research study and will be confidential. I will not identify you by name in the report. We will only identify the name of your business or organization if requested by the organization's leader(s). We request that you do your part to maintain confidentiality for all the participants by not sharing the information shared within this interview outside of the interview setting. However, please note that we cannot guarantee that all participants will maintain confidentiality after this interview. I don't think you'll be surprised by any of our questions, but you may choose to skip a question or stop the interview at any time. The interview should last about 60 minutes. Would you mind if I record the interview? It will help me stay focused on our conversation, and it will ensure I have an accurate record of what we discussed.

For question about the research or in the event of a research-related injury, please contact the Erika Stump at erika.stump@maine.edu or (207) 228.8117. For questions about research subjects' rights,

please contact the Human Protections Administrator, University of Southern Maine at usmorio@maine.edu or (207) 228-8434.

Note: Questions asked of people in different roles may vary.

Background/Opening: To start, could you tell me about your role in this company/organization?

Professional Role/Responsibilities: _____

PROFESSIONAL ELIGIBILITY REQUIREMENTS

1. Please describe the specific minimum requirements to be an eligible applicant for entry-level positions in your organization.

   Possible Probe Questions:

   - Are there positions available to adults who have neither earned a high school diploma nor a GED?
   - Are there positions available to adults who have earned only a GED?

2. What are the preferred professional and/or educational qualifications for entry-level positions in your organization?
3. If earning a high school diploma is a requirement or preferred qualification for employment in your organization, please explain the reason for this expectation?

   Possible Probe:

   - What qualifications, skills, knowledge or characteristics do you believe a high school graduate demonstrates that a person who has not earned a high school diploma may not have demonstrated?

4. Please describe requirements to be eligible for professional advancement in your organization.

   Possible Probe Questions:

   - Is there opportunity for professional advancement for an employee without a high school diploma? If so, please explain some of those opportunities.
   - Are there professional advancement opportunities within your organization that require specialized certification or educational attainment beyond high school? If so, please explain some of those opportunities.

HIGH QUALITY WORKFORCE

5. Maine's proficiency-based diploma law requires students to demonstrate proficiency in content standards *and* guiding principles intended to convey the knowledge, skills, and dispositions of a high school graduate. Other than specialized or technical skills required for

a profession, what are the skills and dispositions your organization values and looks for in new hires?

6. In order to be successful as an employee at your company, what do you consider as the most important knowledge, skills and dispositions?
7. If a position in your organization requires specialized skills, do you provide on-the-job training or do you hire professionals who already have these skills, or both?
8. Describe the most important characteristics of a high quality workforce in Maine.

Thank you for your time.

If I have any additional questions or need clarification, how and when is it best to contact you?

Follow-Up Non-Identifying Contact Info:

_____

Appendix D: Maine Employment Data

Table A: Health Care and Social Assistance Industry Employment Data

Source: Maine Department of Labor, 2015
(*italics* = predicted high growth industry profession)

Job Title	Total Openings	Typical Education Level	Average Wage	% Growth in Openings
Biomedical Engineers	10	Bachelor's Degree	$40.92	55.9
Nurse Practitioners	57	Master's Degree	$46.44	24.9
Physical Therapist Assistants	13	Associate's Degree	$24.24	19.6
Physician Assistants	39	Master's Degree	$49.30	19.2
Diagnostic Medical Sonographers	9	Associate's Degree	$37.05	18.3
Medical Appliance Technicians	1	High School Diploma	$19.61	17.4
Orthoptists and Prosthetists	1	Master's Degree	$28.88	17.1
Physical Therapists	58	Doctoral or Adv Prof Degree	$36.51	16.7
Physical Therapist Aides	8	High School Diploma	$12.61	16.4
Occupational Therapy Assistants	6	Associate's Degree	$23.32	14.6
Home Health Aides	*121*	*No formal education credential*	*$11.50*	*14.4*
Occupational Therapists	33	Master's Degree	$31.25	14.2
Health Technologists and Technicians	11	High School Diploma	$25.76	13.0
Dental Laboratory Technicians	5	High School Diploma	$21.22	12.7
Dietitians and Nutritionists	6	Bachelor's Degree	$27.60	12.2
Ophthalmic Laboratory Technicians	2	High School Diploma	$14.97	11.3

Registered Nurses	*505*	*Bachelor's Degree*	*$30.92*	*11.0*
Nurse Midwives	1	Master's Degree	$45.76	10.4
Medical Assistants	*100*	*Postsecondary non-degree award*	*$15.34*	*10.2*
Ophthalmic Medical Technicians	4	Postsecondary non-degree award	$18.13	10.1
Opticians, Dispensing	15	High School Diploma	$17.71	10.0
Phlebotomists	16	Postsecondary non-degree award	$14.35	10.0
Medical Secretaries	76	High School Diploma	$15.66	9.9
Healthcare Support Workers	11	High School Diploma	$16.41	9.9
Personal Care Aides	*212*	*No formal education credential*	*$10.48*	*9.8*
Surgeons	12	Doctoral or Adv Prof Degree	$126.34	9.7
Healthcare Social Workers	25	Master's Degree	$24.12	9.6
Health Diagnosing and Treating Practitioners	4	Master's Degree	$38.61	9.4
Nursing Assistants	*291*	*Postsecondary non-degree award*	*$12.12*	*9.2*
Medical and Health Services Managers	65	Bachelor's Degree	$45.99	8.8
Medical Records and Health Information Technicians	36	Postsecondary non-degree award	$17.40	8.8
Substance Abuse and Behavioral Disorder Counselors	26	Bachelor's Degree	$21.22	8.7
Surgical Technologists	9	Postsecondary non-degree award	$20.90	8.7
Podiatrists	1	Doctoral or Adv Prof Degree	$80.96	8.6
Physicians and Surgeons	92	Doctoral or Adv Prof Degree	$101.33	8.6
Psychiatric Aides	31	High School Diploma	$12.85	8.5
Dental Assistants	38	Postsecondary non-degree award	$18.17	8.4

Dental Hygienists	27	Associate's Degree	$30.39	8.3
Medical and Clinical Laboratory Technologists	26	Bachelor's Degree	$26.95	7.7
Healthcare Practitioners and Technical Workers	1	Postsecondary non-degree award	$28.82	7.4
Nurse Anesthetists	7	Master's Degree	$80.49	7.3
Medical Equipment Preparers	11	High School Diploma	$15.40	7.2
Radiation Therapists	1	Associate's Degree	$33.32	6.9
Pharmacy Technicians	34	High School Diploma	$14.49	6.8
Dietetic Technicians	2	Associate's Degree	$14.37	6.7
Emergency Management Directors	1	Bachelor's Degree	$27.15	6.7
Emergency Medical Technicians and Paramedics	39	Postsecondary non-degree award	$15.91	6.6
Ambulance Drivers and Attendants, except EMTs	4	High School Diploma	$13.46	5.8
Speech-Language Pathologists	22	Master's Degree	$30.72	5.6
Licensed Practical and Licensed Vocational Nurses	44	Postsecondary non-degree award	$20.39	4.7
Medical Scientists, except Epidemiologists	6	Doctoral or Adv Prof Degree	$50.01	3.6
Pediatricians, General	5	Doctoral or Adv Prof Degree	$87.84	0.6
Medical Transcriptionists	11	Postsecondary non-degree award	$15.89	-2.8

Table B: Job Titles with more than 50 Openings

Source: Maine Department of Labor, 2014

Accountants and Auditors
Architecture and Engineering Occupations
Arts, Design, Entertainment, Sports, and Media Occupations
Automotive Service Technicians and Mechanics
Bartenders

Billing and Posting Clerks
Bookkeeping, Accounting, and Auditing Clerks
Building and Grounds Cleaning and Maintenance Occupations
Bus and Truck Mechanics and Diesel Engine Specialists
Business and Financial Operations Occupations
Carpenters
Cashiers
Childcare Workers
Combined Food Preparation and Serving Workers, Including Fast Food
Community and Social Service Occupations
Computer and Mathematical Occupations
Construction and Extraction Occupations
Construction Laborers
Cooks, Institution and Cafeteria
Cooks, Restaurant
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
Customer Service Representatives
Dishwashers
Education, Training, and Library Occupations
Electricians
Farmers, Ranchers, and Other Agricultural Managers
Farming, Fishing, and Forestry Occupations
Financial Managers
Firefighters
First-Line Supervisors of Food Preparation and Serving Workers
First-Line Supervisors of Office and Administrative Support Workers
First-Line Supervisors of Retail Sales Workers
Food Preparation and Serving Related Occupations
Food Preparation Workers
General and Operations Managers
Hairdressers, Hairstylists, and Cosmetologists
Healthcare Practitioners and Technical Occupations
Healthcare Support Occupations
Heavy and Tractor-Trailer Truck Drivers
Helpers--Production Workers
Highway Maintenance Workers
Home Health Aides
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop
Hotel, Motel, and Resort Desk Clerks
Installation, Maintenance, and Repair Occupations
Insurance Sales Agents
Janitors and Cleaners, Except Maids and Housekeeping Cleaners

Laborers and Freight, Stock, and Material Movers, Hand
Landscaping and Groundskeeping Workers
Legal Occupations
Life, Physical, and Social Science Occupations
Light Truck or Delivery Services Drivers
Maids and Housekeeping Cleaners
Maintenance and Repair Workers, General
Management Occupations
Managers, All Other
Medical and Health Services Managers
Medical Assistants
Medical Secretaries
Nurse Practitioners
Nursing Assistants
Office and Administrative Support Occupations
Office Clerks, General
Packaging and Filling Machine Operators and Tenders
Packers and Packagers, Hand
Personal Care Aides
Personal Care and Service Occupations
Physical Therapists
Physicians and Surgeons, All Other
Police and Sheriff's Patrol Officers
Production Occupations
Protective Service Occupations
Receptionists and Information Clerks
Registered Nurses
Retail Salespersons
Sales and Related Occupations
Sales Representatives, Services, All Other
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive
Social and Human Service Assistants
Stock Clerks and Order Fillers
Team Assemblers
Tellers
Total, All Occupations
Transportation and Material Moving Occupations
Waiters and Waitresses
Welders, Cutters, Solderers, and Brazers

Table C: Detailed Industry Employment and Change Data

Source: Maine Department of Labor, 2014

Industry Group	2024 Employment	Net Change	Percent Change	2014 Employment	Detailed Industry
Manufacturing	211	-116	-35.5%	327	Apparel manufacturing
Manufacturing	4,300	-1,851	-30.1%	6,151	Paper manufacturing
Manufacturing	1,050	-407	-27.9%	1,457	Printing and related support activities
Manufacturing	575	-166	-22.4%	741	Textile product mills
Manufacturing	924	-259	-21.9%	1,183	Textile mills
Manufacturing	1,510	-419	-21.7%	1,929	Plastics and rubber products manufacturing
Manufacturing	1,834	-458	-20.0%	2,292	Computer and electronic product manufacturing
Manufacturing	1,455	-297	-17.0%	1,752	Leather and allied product manufacturing
Manufacturing	18,686	-3,746	-16.7%	22,432	Nondurable Goods
Information	1,878	-362	-16.2%	2,240	Publishing industries, except Internet
Manufacturing	1,005	-183	-15.4%	1,188	Furniture and related product manufacturing
Manufacturing	3,900	-685	-14.9%	4,585	Wood product manufacturing
Manufacturing	300	-50	-14.3%	350	Petroleum and coal products manufacturing
Total, All Industry Groups	43,695	-6,485	-12.9%	50,180	Manufacturing
Information	922	-128	-12.2%	1,050	Broadcasting, except Internet
Manufacturing	4,507	-595	-11.7%	5,102	Food manufacturing
Manufacturing	7,842	-881	-10.1%	8,723	Transportation equipment manufacturing
Manufacturing	25,009	-2,739	-9.9%	27,748	Durable Goods
Trade, Transportation, and Utilities	1,400	-151	-9.7%	1,551	Utilities
Total, All Industry Groups	6,715	-688	-9.3%	7,403	Information
Natural Resources & Mining	2,138	-208	-8.9%	2,346	Forestry and logging
Information	2,080	-185	-8.2%	2,265	Telecommunications
Manufacturing	4,511	-385	-7.9%	4,896	Fabricated metal product manufacturing

Total, All Industry Groups	76,140	-6,468	-7.8%	82,608	Goods-Producing Industries
Trade, Transportation, and Utilities	650	-50	-7.1%	700	Rail transportation
Manufacturing	1,210	-85	-6.6%	1,295	Nonmetallic mineral product manufacturing
Trade, Transportation, and Utilities	1,567	-94	-5.7%	1,661	Furniture and home furnishings stores
Trade, Transportation, and Utilities	7,450	-440	-5.6%	7,890	Merchant wholesalers, durable goods
Trade, Transportation, and Utilities	4,820	-276	-5.4%	5,096	Clothing and clothing accessories stores
Manufacturing	361	-19	-5.0%	380	Electrical equipment and appliance manufacturing
Government	55,756	-2,589	-4.4%	58,345	Local Government
Government	13,450	-574	-4.1%	14,024	Federal Government
Total, All Industry Groups	91,930	-3,580	-3.7%	95,510	Government
Natural Resources & Mining	6,022	-208	-3.3%	6,230	Agriculture, Forestry, Fishing and Hunting
Total, All Industry Groups	6,212	-208	-3.2%	6,420	Natural Resources and Mining
Trade, Transportation, and Utilities	5,252	-174	-3.2%	5,426	Nonstore retailers
Trade, Transportation, and Utilities	7,744	-238	-3.0%	7,982	Merchant wholesalers, nondurable goods
Information	425	-13	-3.0%	438	ISPs, search portals, and data processing
Trade, Transportation, and Utilities	19,194	-576	-2.9%	19,770	Wholesale Trade
Financial Activities	10,382	-198	-1.9%	10,580	Credit intermediation and related activities
Government	22,724	-417	-1.8%	23,141	State Government
Manufacturing	2,276	-37	-1.6%	2,313	Machinery manufacturing
Total, All Industry Groups	61,700	-600	-1.0%	62,300	Self-Employed, Private Household, and Unpaid Family Workers
Trade, Transportation, and Utilities	2,925	-28	-0.9%	2,953	Sporting goods, hobby, book and music stores
Financial	12,651	-103	-0.8%	12,754	Insurance carriers and

Activities					related activities
Financial Activities	24,536	-141	-0.6%	24,677	Finance and Insurance
Manufacturing	1,750	-6	-0.3%	1,756	Miscellaneous manufacturing
Total, All Industry Groups	119,082	-372	-0.3%	119,454	Trade, Transportation, and Utilities
Total, All Industry Groups	31,123	-23	-0.1%	31,146	Financial Activities
Natural Resources & Mining	2,082	0	0.0%	2,082	Crop production
Natural Resources & Mining	907	0	0.0%	907	Animal production
Natural Resources & Mining	495	0	0.0%	495	Fishing, hunting and trapping
Natural Resources & Mining	400	0	0.0%	400	Agriculture and forestry support activities
Natural Resources & Mining	190	0	0.0%	190	Mining
Manufacturing	320	0	0.0%	320	Primary metal manufacturing
Manufacturing	1,252	0	0.0%	1,252	Beverage and tobacco product manufacturing
Trade, Transportation, and Utilities	2,026	0	0.0%	2,026	Electronics and appliance stores
Trade, Transportation, and Utilities	13,107	0	0.0%	13,107	General merchandise stores
Trade, Transportation, and Utilities	178	0	0.0%	178	Air transportation
Trade, Transportation, and Utilities	88	0	0.0%	88	Water transportation
Trade, Transportation, and Utilities	5,825	0	0.0%	5,825	Truck transportation
Trade, Transportation, and Utilities	1,598	0	0.0%	1,598	Transit and ground passenger transportation
Trade, Transportation, and Utilities	91	0	0.0%	91	Pipeline transportation
Trade, Transportation, and Utilities	317	0	0.0%	317	Scenic and sightseeing transportation
Trade, Transportation,	32	0	0.0%	32	Postal Service

and Utilities					
Trade, Transportation, and Utilities	1,950	0	0.0%	1,950	Couriers and messengers
Trade, Transportation, and Utilities	4,146	0	0.0%	4,146	Warehousing and storage
Information	679	0	0.0%	679	Motion picture and sound recording industries
Information	731	0	0.0%	731	Other Information Services
Financial Activities	3	0	0.0%	3	Funds, trusts, and other financial vehicles
Trade, Transportation, and Utilities	18,091	36	0.2%	18,055	Food and beverage stores
Trade, Transportation, and Utilities	16,505	38	0.2%	16,467	Transportation and Warehousing
Construction	17,050	50	0.3%	17,000	Specialty trade contractors
Trade, Transportation, and Utilities	81,983	317	0.4%	81,666	Retail Trade
Other Services	11,411	88	0.8%	11,323	Membership associations and organizations
Total, All Industry Groups	666,763	5,319	0.8%	661,444	Total Employment
Total, All Industry Groups	26,233	225	0.9%	26,008	Construction
Total, All Industry Groups	605,063	5,919	1.0%	599,144	Wage and Salary Jobs
Other Services	5,535	69	1.3%	5,466	Repair and maintenance
Trade, Transportation, and Utilities	4,495	64	1.4%	4,431	Miscellaneous store retailers
Trade, Transportation, and Utilities	7,800	112	1.5%	7,688	Building material and garden supply stores
Financial Activities	2,069	31	1.5%	2,038	Rental and leasing services
Total, All Industry Groups	23,286	370	1.6%	22,916	Other Services
Other Services	4,290	71	1.7%	4,219	Personal and laundry services
Construction	2,983	51	1.7%	2,932	Heavy and civil engineering construction
Financial	6,587	118	1.8%	6,469	Real Estate and Rental

Activities					and Leasing
Total, All Industry Groups	513,133	9,499	1.9%	503,634	Total Private
Financial Activities	4,518	87	2.0%	4,431	Real estate
Construction	6,200	124	2.0%	6,076	Construction of buildings
Trade, Transportation, and Utilities	4,000	82	2.1%	3,918	Health and personal care stores
Professional and Business Services	9,300	219	2.4%	9,081	Management of companies and enterprises
Leisure and Hospitality	6,588	158	2.5%	6,430	Amusements, gambling, and recreation
Trade, Transportation, and Utilities	4,000	102	2.6%	3,898	Electronic markets and agents and brokers
Leisure and Hospitality	12,153	344	2.9%	11,809	Accommodation
Trade, Transportation, and Utilities	7,600	220	3.0%	7,380	Gasoline stations
Professional and Business Services	2,019	71	3.6%	1,948	Waste management and remediation services
Trade, Transportation, and Utilities	10,300	375	3.8%	9,925	Motor vehicle and parts dealers
Total, All Industry Groups	436,993	15,967	3.8%	421,026	Service-Providing Industries
Leisure and Hospitality	8,713	321	3.8%	8,392	Arts, Entertainment, and Recreation
Total, All Industry Groups	65,641	2,450	3.9%	63,191	Leisure and Hospitality
Leisure and Hospitality	56,928	2,129	3.9%	54,799	Accommodation and Food Services
Leisure and Hospitality	44,775	1,785	4.2%	42,990	Food services and drinking places
Education and Health Services	12,848	530	4.3%	12,318	Educational services
Education and Health Services	18,973	873	4.8%	18,100	Social assistance
Trade, Transportation, and Utilities	1,630	88	5.7%	1,542	Support activities for transportation
Professional and Business Services	26,306	1,424	5.7%	24,882	Professional, scientific and technical services
Leisure and Hospitality	1,505	86	6.1%	1,419	Performing arts and spectator sports

Education and Health Services	35,100	2,310	7.0%	32,790	Hospitals
Other Services	2,050	142	7.4%	1,908	Private households
Total, All Industry Groups	68,325	4,846	7.6%	63,479	Professional and Business Services
Total, All Industry Groups	122,771	9,383	8.3%	113,388	Education and Health Services
Education and Health Services	25,050	1,942	8.4%	23,108	Nursing and residential care facilities
Education and Health Services	109,923	8,853	8.8%	101,070	Health Care and Social Assistance
Professional and Business Services	32,719	3,203	10.9%	29,516	Administrative and Waste Services
Professional and Business Services	30,700	3,132	11.4%	27,568	Administrative and support services
Financial Activities	1,500	160	11.9%	1,340	Securities, commodity contracts, investments
Education and Health Services	30,800	3,728	13.8%	27,072	Ambulatory health care services
Leisure and Hospitality	620	77	14.2%	543	Museums, historical sites, zoos, and parks
Manufacturing	2,602	414	18.9%	2,188	Chemical manufacturing