RECOMMENDATIONS TO IMPROVE THE NATION'S WORKFORCE AND LABOR MARKET INFORMATION SYSTEM

Submitted to:

Alexander Acosta, Secretary
U.S. Department of Labor

WORKFORCE INFORMATION ADVISORY COUNCIL

January 2018

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Workforce Information Advisory Council

WASHINGTON, DC

January 25, 2018

The Honorable R. Alexander Acosta, Secretary
U.S. Department of Labor
Frances Perkins Building
200 Constitution Ave., NW
Washington, DC 20210

Dear Secretary Acosta:

Pursuant to the Workforce Innovation and Opportunity Act of 2014, the Workforce Information Advisory Council is pleased to provide for your consideration a series of recommendations to improve the nation's Workforce and Labor Market Information System. The Council believes that adoption of the recommendations would substantially improve the operation of the nation's labor markets and strengthen its competitiveness—as recently called for by President Trump.

These recommendations were unanimously approved by the Council and were informed by the input from numerous subject matter experts and members of the public.

Through its recommendations, the Council aims to support Congress's intent and your efforts to ensure that individual students, workers, educators, and employers have the information each needs to make good decisions in the realms of education and employment. The Council believes that improved workforce information will result in more effective workforce investments, more efficient labor markets, and a more fully employed labor force across the nation.

We look forward to working with you to ensure that this vision becomes a reality.

Respectfully yours,

Cynthia Forland, Chair

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WORKFORCE INFORMATION ADVISORY COUNCIL

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National Business or Trade Organizations	Mark McKeen	General Motors
Economic Development Entities	Jennifer Zeller	Georgia Power, Community & Economic Development
Labor Organizations	Chelsea Orvella	Society of Professional Engineering Employees in Aerospace, IFPTE Local 2001
Providers of Training Services	Angela Pate	University of Florida Startup Quest, OwnForce, Inc.
Workforce Development Boards	Bruce Ferguson	CareerSource of Northeast Florida
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State Workforce Investment Agencies	Aaron Fichtner*	New Jersey Department of Labor and Workforce Development
State Workforce Investment Agencies	Bruce Madson	Ohio Department of Job and Family Services
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WLMI Directors	Brenda Lisbon****	South Carolina Department of Employment and Workforce
WLMI Directors	Mathew Barewicz	Vermont Department of Labor

* Member resigned due to new appointment in January 2018.
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*** Member resigned due to new position in July 2017.
**** Member resigned due to retirement in January 2018.

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Introduction

Through the Workforce Innovation and Opportunity Act of 2014 (WIOA), Congress directs the Secretary of Labor to oversee development of a workforce and labor market information system (WLMIS) that enables state and local labor market participants—including employers, students, workers, workforce investment boards, and education and training agencies and institutions—to make informed decisions.[1] The law directs the Secretary to develop the WLMIS:

- through the Bureau of Labor Statistics (BLS) and the Employment and Training Administration (ETA);
- in collaboration with states;
- in cooperation with the heads of other federal agencies to ensure complementarity and nonduplication; and
- in consultation with the 14-member Workforce Information Advisory Council (WIAC) appointed by the Secretary.

In fulfillment of Secretary Acosta's directive in the WIAC charter to provide written recommendations concerning the evaluation and improvement of the nationwide workforce and labor market information system, the WIAC is honored to present this document for his consideration.[2]

Importance of Workforce and Labor Market Information

Workforce and labor market information (WLMI) consists of the data and information used by businesses, workers, students, jobseekers, education and training providers, workforce development planners and policymakers, and others, to make informed decisions in areas such as hiring and advancement, career choice, curriculum development, and investments in training.

Workforce and labor market information is essential to the nation's economy, providing for the efficient operation of labor markets by supplying quality labor market intelligence. Accurate, objective, relevant, timely, and accessible WLMI is critical for:

- building a skilled workforce that spurs business competitiveness and economic growth;
- strengthening career pathways and guiding skill attainment for good jobs, economic opportunity, and career growth;
- understanding the rapidly changing nature of work and how it impacts the workforce and U.S. economy; and
- using evidence-based policymaking to ensure the effective use of workforce training and education funds.

Summary of Recommendations

The WIAC was guided in the development of its specific recommendations by information-related objectives and priorities articulated in WIOA; the Secretary's draft strategic plan for fiscal years 2018-2022; President Trump's Executive Order 13801, June 15, 2017, "Expanding Apprenticeships in America"; Secretary Acosta's meeting with the WIAC on November 2, 2017; and President Trump's National Security Strategy, Pillar II: Promote American Prosperity; among others. Collectively, these objectives and priorities include:

- Enabling state and local workforce boards to *identify in-demand occupations and industries*, as required by WIOA;
- Addressing students' *career awareness gap* – facilitate their ability to make informed choices about career and educational options, including apprenticeships, industry-recognized certifications, and other non-degree credentials;[3]
- Enhancing the capacity of education and training institutions to *graduate students with the knowledge, skills, and abilities sought by employers*;[4]
- Facilitating evidence-based policymaking through coordination with and assistance to states in building their capacity to *conduct rigorous program assessments and evaluations* as called for by WIOA;[5] and
- Recognizing the *changing natures of*:
  - education—in terms of increased emphasis on competencies attainment; non-traditional credentials and modes of learning; and the growing number of adult learners;[6] and
  - work—in terms of the ongoing transformation of occupations by technology and the rise of non-traditional work arrangements.[7]

Through a series of Council meetings and numerous subcommittee deliberations, which included reviews of existing products, programs and initiatives, discussions with subject matter experts, and consideration of public comments, the Council examined many areas and elements of the workforce and labor market information system. The following nine recommendations received the unanimous support of the members of the Council.

Recommendations on WLMI Products

Recommendation 1. Enhance UI Wage Records

The WIAC recommends that the Secretary pursue the inclusion of additional data elements to unemployment insurance (UI) wage records, including occupational title, hours worked, and work site.

Recommendation 2. Expand Information on Occupations, Skills, and Credentials

The WIAC recommends that the Secretary increase investments in information on the workforce skill requirements of current and emerging occupations, including credential attainment and outcomes, and transferability of skills among industries and occupations.

Recommendation 3. Develop and Disseminate a K-12 Career Awareness Educational Framework

The WIAC recommends that the Secretary develop, disseminate, and regularly update a K-12 career awareness educational framework to address the career awareness gap and increase public understanding of career pathways and options starting at an early age.

Recommendation 4. Develop Information on the Changing Nature of Work

The WIAC recommends that the Secretary pursue the regular collection and development of information that provides an understanding of the scope and volume of alternative work arrangements or other causes for the reduction in traditional workforce participation.

Recommendations on the WLMI System

Recommendation 5. Increase Support for the States' Roles in the WLMI System

The WIAC recommends that the Secretary include in the Department of Labor budget for FY2020 a request for annual funding to states from BLS for the Federal-State Cooperative Statistics System and from ETA for Workforce Information Grants to States at twice the current funding level to strengthen the provision of state and local information in the nationwide WLMIS.

Recommendation 6. Overcome Barriers to Data Sharing

The WIAC recommends that the Secretary enable greater use of WLMI for evidence-based workforce investment decision making by supporting the implementation of relevant recommendations of the Commission on Evidence-Based Policymaking.

Recommendation 7. Improve Consistency and Availability of Program Evaluation Data

The WIAC recommends that the Secretary improve consistency and availability of workforce program assessment and evaluation data by establishing the state WLMI unit or other unit determined by the state as the designated state entity for the provision of WIOA workforce program participant outcomes, performance assessments and evaluations.

Recommendation 8. Create a 21st Century WLMI System Using Advanced Technologies

The WIAC recommends that the Secretary create a twenty-first century WLMIS based on a distributed knowledge management system that uses an open architecture/open data approach and artificial intelligence and related advanced technologies.

Recommendation 9. Initiate Collaboration Among WLMI System Agencies

The WIAC recommends that the Secretary initiate collaboration among WLMIS agencies by directing ETA and BLS to convene a gathering of representatives from federal and state programs that contribute information essential to a well-functioning workforce and labor market information system, as authorized by Congress.

Recommendation 1

Enhance UI Wage Records

The WIAC recommends that the Secretary pursue the inclusion of additional data elements to UI wage records, including, but not limited to, occupational title, hours worked, and work site.

Why This is Needed: The inclusion of additional data elements on wage records would have many benefits, enabling production of valuable information not currently available, including much needed local data. Among the benefits are the following:

- It would provide the ability to obtain better data on employment outcomes related to training and education, which can inform businesses, workers, and students of the value of investments in training and education programs.
- It would enable production of detailed state and local area information on employment by occupation, hours of work, and wages, which would inform employer location and recruitment decisions, as well as individual work search.
- It would enable the analysis and improved understanding of career pathways or ladders.
- Other federal WLMI programs and their products, such as the Occupational Employment Statistics (OES), the Quarterly Census of Employment and Wages (QCEW), and the Longitudinal Employer-Household Dynamics (LEHD) programs would be enriched.
- It would enable the production of occupational wage trends that cannot currently be produced.
- It would contribute to the production of important information regarding emerging, growing, and shrinking occupations.
- It would enable states to do a better job of maintaining a skilled workforce, providing better job applicants for business, reducing hiring and UI costs for employers, and reducing overall public assistance costs.
- It could lead to reduced employer survey burden and cost savings through the eventual elimination of the OES survey and reduced need for additional surveys and data cleansing/correction activities.

There are, however, issues and concerns with pursuing the enhancement of wage records among some affected employers and state UI agencies. In September 2015, the Workforce Information Council (WIC) released *Enhancing Unemployment Insurance Wage Records: Potential Benefits, Barriers, and Opportunities*, which summarized the findings of a three-year study that "explored using the administrative records as an alternative source for improving local and state labor market information . . . for state and local education and training program planning and accountability, economic analysis, career planning, and workforce program administration."[8]

According to the WIC report, business associations highly valued the potential benefits of enhanced wage records, as did respondents associated with human resource functions; however, many individual businesses and persons associated with payroll divisions expressed concerns over reporting burdens and cost. Small employers in particular felt they were at a disadvantage in accessing resources necessary to provide the additional details on the reports.

However, the WIC study also found that several of the data elements that have been the focus of discussions on wage record enhancement are currently available in the payroll systems of most employers. In thirteen states, employers have been able to report additional variables. Moreover, substantial numbers of employers use either commercial payroll software or contract providers to prepare their reports, and a majority of payroll services firms are capable of handling most of the enhanced wage record variables. In addition to interest in the potential benefits for human resource functions, employers desired simplified reporting, including clarified and standardized data element definitions, which currently differ from state to state.

State UI agencies also varied in their responses to wage record changes. While most states require employers to report electronically, which facilitates modifications to the wage records and lowers the marginal costs of adding variables, there are still states running legacy systems that expressed concerns regarding the difficulty of adding variables to existing systems and the time and resources needed to replace those systems. In addition, it was noted that while use of paper reporting was diminishing, in some states there are still many employers who continue to report using paper forms.

How This Can Be Implemented: The Secretary should direct ETA and BLS to jointly lead an effort, with state participation, to establish strategies and processes that will promote the enhancement of UI wage records. In accordance with and in supplement to the WIC report, the following actions are recommended:

- Provide opportunities for affected parties to participate in wage record enhancement planning, including state labor market information (LMI) divisions and UI administrative agencies, payroll services and software firms, and businesses and business associations.
- Establish national standards by identifying and pursuing:
    - common data elements that should be collected by all states;
    - standardized data element titles, definitions, and reporting requirements;
    - appropriate employer incentives for accurate, complete, and timely reporting;
    - alternative implementation strategies;
    - standard reporting formats and methods;
    - legislative actions; and
    - common system capabilities.
- Provide financial assistance and/or other incentives to encourage states to:
    - complete UI-system modernization projects to accommodate wage-record enhancement;
    - adopt national system standards;
    - increase electronic reporting; and
    - begin or expand enhanced data collection.
- Develop tools to assist with occupational and geographic coding and that minimize or eliminate the need for employer involvement.
- Develop employer training and technical assistance materials, with the assistance of the American Payroll Association, to explain new reporting elements, their benefits, and methods for completing them.

Recommendation 2

Expand Information on Occupations, Skills, and Credentials

The WIAC recommends that the Secretary increase investment in information on the workforce skill requirements of current and emerging occupations, on credential attainment and workforce outcomes, and on transferability of skills among industries and occupations. As part of this investment, the WIAC recommends that the Department of Labor lead an initiative to establish a comprehensive resource of credentials that creates standards in the labor market for, and a common understanding of the labor market value of, degrees, certificates, industry certifications, and licenses.

Why This Is Needed: Students, jobseekers and workers need up-to-date information on in-demand occupations, required job skills, and what may be required to enable them to move from one job to another. Businesses need timely and accessible information on the skills of the talent pool and confidence that the credentials workers obtain will help prepare the workers to meet the challenges of their business operations. Education and training providers need current information on the knowledge, skills, and competencies required by occupations in order to make strategic investments in curricula to effectively serve students and the businesses that hire them.

O*NET, a resource maintained by ETA, is the nation's primary source of occupational information. Additional occupational information is provided by the BLS Occupational Employment Statistics (OES) and Employment Projection programs. O*NET contains hundreds of standardized and occupation-specific descriptors on almost 1,000 occupations covering the entire U.S. economy. It is essential that this indispensable resource be maintained and improved to ensure our understanding of the rapidly changing attributes of work and how it impacts the workforce and the U.S. economy. While it is continually updated from input by a broad range of workers in each occupation, there is concern that it is not keeping pace with the changes occurring in the workplace. The Department of Labor's (DOL) 2016 and 2017 budget requests included funding, not received, to study and test approaches "to modernize and potentially streamline data collection" for O*Net to provide "up to date coverage of occupations and skills, particularly for high growth, changing industries."[9]

While O*NET provides comprehensive information on hundreds of occupations, there is no comparable resource with respect to credentials—including degrees, certifications, licenses and certificates—and their value to gainful employment. In an efficient and effective labor market, employers and workers require access to a reliable source of credentials that reflect the knowledge and skills relevant to jobs. Employers need to be confident that credentials can be depended upon for hiring job candidates with the knowledge and skills they need. Workers, jobseekers, and students need to be confident that their investments in education and training will provide them the competencies that prepare them for positions that employers are seeking to fill.

To address this need, ETA has compiled and maintains information on occupational certifications, but acknowledges the resource to be incomplete and lacking information on the number of certification holders and their employment relative to the certifications they received. ETA has also compiled and is seeking to improve a resource of state-specific information on occupational licenses.

A number of other interested groups have undertaken initiatives to improve the credentialing marketplace. One non-profit organization, Credential Engine, has made efforts to promote collaboration among credentialing stakeholders and to establish an open credential registry to be populated through the voluntary participation of credentialing organizations.[10] Though still in early stages of development, this initiative is promising if participation by a critical mass of education and training organizations can be achieved.

How This Can Be Implemented: The WIAC recommends that the following approaches be taken to enhance information available on occupations, skills and credentials:

1) Identify occupations and the necessary skills for those occupations that are changing most rapidly and update O*NET content for them more frequently. Aggregated job openings data should be seen as possible indicators of evolving occupational skill sets, and enhanced wage records should be seen as a possible information source on emerging occupations. Existing O*NET capabilities can be used to create or improve tools that both job seekers and employers utilize to identify skills that are transferable from one occupation to another and what is needed to make those transitions.
2) Use information on rapidly changing and emerging occupations to identify the need for Standard Occupational Classification (SOC) revisions, and consider how these changes may be incorporated into the SOC more timely than current update timeframes permit. Any improvement that could be made in updating the SOC would benefit the overall discussion of occupations and skills and their supply and demand in the labor market.
3) Explore a partnership with the Department of Education (ED) to develop a skills-based crosswalk between occupations and training programs, further defining career pathways.
4) The Council recognizes a DOL role in increasing the transparency of the value credentials and the credibility of credentialing programs. DOL should ensure the establishment and maintenance of this resource. Actions to pursue include:
    - promoting joint efforts by DOL and private organizations to establish and maintain a comprehensive resource of credentials and improved data on the outcomes for individuals who obtain credentials.
    - exploring the mining of resumes on the Internet for credentials.
    - working with licensing bodies to determine how to collect and maintain licensing information by occupation.
    - establishing public-private partnerships to create employer-driven initiatives to identify the credentials that are valued in the labor market.
    - expanding the collection of credential information by occupation through O*NET and ACS data collection activities.
    - expanding the availability of credential information like that displayed in the CyberSeek Cybersecurity Heat Map[11] to other occupations.
    - establishing a methodology to produce information on the employment outcomes of persons who obtain credentials. This will provide new information on the value of credentials, giving workers and businesses greater confidence that a credential will contribute to success on the job.
    - maintaining credential characteristics, including, among other details, type of credential, associated industry, awarding entity, geographic location of the award, and employment outcomes of persons obtaining the credential.

Recommendation 3

Develop and Disseminate a K-12 Career Awareness Educational Framework

The WIAC recommends that the Secretary develop, disseminate, and regularly update a K-12 career awareness educational framework to address the career awareness gap and increase public understanding of career pathways and options starting at an early age. The educational framework should be developed for voluntary use by public schools through a joint U.S. Department of Labor (DOL) and U.S. Department of Education (ED) initiative and state pilot grant program, and designed to:

- provide standardized, replicable, and customizable career guidance educational materials appropriate to three K-12 levels—elementary, middle, and high school;
- promote proficiency in understanding basic labor market concepts, industry, occupation, and skills data, and the changing nature of work in the U.S. economy;
- leverage existing career guidance materials produced by ETA, BLS, state workforce agencies, the National Career Development Association, and others; and
- increase the capacity among state and local education agencies to better address the career awareness gap among youth.

Why This Is Needed: As reported by BLS, the labor force participation rate of young people has been declining,[12] and BLS projects the decline to continue.[13] Postponement of entry into the labor market has negative effects on individuals and the economy as it delays important experiential learning in the labor market. Early job searches and early employment inform future decisions on education and career pathways. For example, too often young people learn about career technical education after high school or realize after post-secondary graduation that they are not interested in employment in their field of study. Systematic dissemination of critical industry, occupation, skills, and other career awareness information will reduce the number of "wrong turns" people make when starting out in the labor market.

In addition, too many people are not sufficiently aware of the economic infrastructure of modern society to understand how their unique skillsets could help them profit from gainful employment. The general public's lack of career awareness spans the gamut of career guidance information—from industry, occupation, and skills data, to what jobs and career pathways lead to greater economic security, to what training or education is needed. Young people are often unaware of accessible career paths that do not require college degrees, including apprenticeship employment and training and other technical education and work-based learning opportunities. Furthermore, career counseling in public schools tends to encourage students to attend four-year colleges. By focusing on youth, this recommendation seeks to address career awareness needs at an early age.

How This Can Be Implemented: The following four strategies address processes for launching and supporting this initiative and key design concepts for developing the framework.

(1) Establish a DOL-ED Memorandum of Understanding, including joint federal funding commitments to support this initiative. The departments should collaboratively determine

who will develop the standard educational framework and parameters for the state pilot grants, overall timeline and budget, and funding sources.

(2) Develop the standard educational framework at the federal level by engaging knowledgeable professionals in its creation (in-house or contracted), using existing materials, and including key concepts. Existing career guidance materials should be packaged within the framework, including, for example, those from ETA's vast library housed on the CareerOneStop website, from the BLS Occupational Outlook Handbook (OOH), and from the National Career Development Association. Currently available materials are excellent but lack context and an educational framework to support teacher use and customization. The framework should be designed to:

- be standardized but flexible so that states and teachers can customize content based on local labor markets and customize content delivery within regular classroom lessons;
- provide up-to-date content and experiential activities such as employer and job-site field trips or classroom presentations;
- provide K-12 students with three levels of career awareness activities by introducing industries in primary school and covering occupations in middle school, thereby providing the foundation for personalized learning and career plans in high school; and
- include a "community-based learning approach" by having students present the content to parents, siblings, or neighbors as part of their coursework, thereby reinforcing the learning and increasing public sharing of career awareness knowledge.

(3) Establish a joint DOL-ED state pilot grant program. Pilot grants should be used by states to: create a state-level workforce and education agency partnership to support the initiative; customize the standard educational framework developed at the federal level to address unique state labor market and educational needs, leveraging existing state materials; develop a train-the-trainer process for preparing public school teachers to use the framework; pilot test the state framework; and disseminate and promote use of the customized state framework throughout the state public school system.

(4) Execute a joint DOL-ED dissemination strategy to ensure the framework is available to all public schools and its voluntary use is promoted.

Recommendation 4

Develop Information on the Changing Nature of Work

The WIAC recommends that the Secretary pursue the regular collection and development of information that provides an understanding of the scope and volume of alternative work arrangements or other causes for the reduction in traditional workforce participation.

Why This Is Needed: There is increasing evidence that the traditional nature of full-time employment with one employer is giving way to a growing segment of voluntary and involuntary contingent workers (workers who do not have an explicit or implicit contract for long-term employment) and workers with alternative work arrangements (on-call workers, temp agency workers, independent contractors, and workers provided by contract firms). A thorough understanding of this evolution is needed to provide for deeper comprehension of its implications on businesses, individuals, and families. A failure to understand these changes could lead federal, state, and local policymakers to make erroneous and ineffective investments of limited resources.

Present sources of information in this area reveal potential policy issues, but have had lacked consistency, thoroughness, and precision. In 2015, the Government Accountability Office released an analysis of various national data sources of contingent work, noting the widely varying definitions used, the current difficulty in identifying emerging trends, and the likelihood of contingent workers to experience job instability, lower earnings, fewer benefits, and greater reliance on public assistance.[14]

BLS received one-time funding to collect information on contingent workers in 2017. The Contingent Worker Survey was previously conducted five times by BLS, but was discontinued after 2005 due to lack of funding. The change in the nature of work has grown since then and is expected to continue. In a 2016 study, researchers conducted a version of the Contingent Worker Survey and found a significant increase from 2005 to 2015 in the incidence of alternative work arrangements in the U.S. economy. They reported the percentage of workers engaged in alternative work arrangements—defined as temporary help agency workers, on-call workers, contract workers, and independent contractors or freelancers—had risen from 10.1 to 15.8 percent.[15]

There have been efforts by others to gather information on the changing nature of work. Nation1099, a website dedicated to the professional independent contractor and the "gig" economy, compiled and reviewed surveys and studies on the changes taking place. A summary of their findings includes citations such as:

- *7.6 million Americans will be working in the on-demand economy regularly by 2020.* Intuit Investor Forecast
- *By 2027, more than half of American workers—58 percent—will have had some experience as independent contractors.* MBO Partners Looking Forward: What Will the Independent Workforce Look Like In 2027?
- *44 percent of business leaders say the top socio-economic driver of changes in industry is the "changing nature of work, flexible work."* The Future of Jobs Report. World Economic Forum.[16]

Further, Technology Vision 2017, a report by Accenture, predicts that ultimately the legacy models of employment will be "dissolved and replaced with talent marketplaces" driven by the "surge of on-demand labor platforms and online work management solutions."[17]

How This Can Be Implemented: The WIAC recommends that the Secretary pursue funding for BLS to conduct the Contingent Worker Survey on a regular basis in order to increase our knowledge and understanding of the changing nature of work, its impact on businesses and workers, and how the workforce investment system can continue to effectively support their evolving needs. Further, BLS should consider providing an option for states to invest in an expanded Current Population Survey sample to enable the production of state-level data on the changing nature of work, which would identify the varying extent to which this is taking place in labor markets across the nation, and strengthen measures of other characteristics of local labor markets.

Recommendation 5

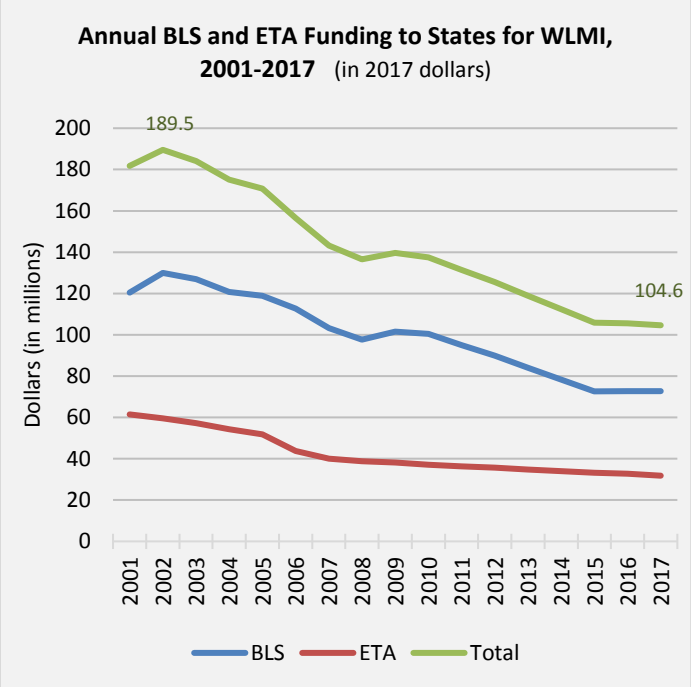
Increase Support for the States' Roles in the WLMI System

The WIAC recommends that the Secretary include in the Department of Labor budget for FY2020 a request for annual funding to states from BLS for the Federal-State Cooperative Statistics System and from ETA for Workforce Information Grants to States (WIGS) at twice the current funding level; that is, from $104.8 million in FY2017 to $209.6 million in FY2020.

- BLS labor statistics funding from $72.8 million in FY2017 to $145.6 million in FY2020.
- ETA WIGS funding from $32 million in PY2017 to $64 million in FY2020.

Why This Is Needed: BLS and ETA funding to states is essential for the production, dissemination, and analysis of state and local labor force statistics. These data are a central component of the WLMIS, as specified by Congress, and are critical to state and local government decision makers and public and private labor market participants. Moreover, state and local WIOA and ED grantees use state-produced data to determine investments of $4 billion in education and training programs for "in-demand occupations and industries," as required by law.[18]

In 2017, total annual federal support for state-produced labor force statistics was $104.6 million. In real (inflation-adjusted) terms, this figure is 45 percent less than total funding of $189.5 million in 2002.[19] (See graph.)



The ongoing decline in real funding since 2002 has led to reductions in the quantity and quality of WLMI important to the participants in the workforce system. In response to a request for information, a significant majority of 25 responding state LMI agencies indicate that they have reduced the availability of state and sub-state WLMI products and services. A number specifically note that, as a result, their capacity to provide information on "in-demand occupations and industries," as required by WIOA, is diminished. (See box for examples of lost state capacity.)

Overview of State LMI Agency Responses Regarding Diminished WLMI Capacity Due to Cuts in BLS and ETA Grants

Individual state LMI agencies report to BLS and ETA that the decline in federal funding has led to the loss of one or more the following aspects of WLMI capacity:

- Data Collections – elimination of:
  - Surveys – vacancy, labor availability, skill gaps, fringe benefits, industry-specific
  - Real-time LMI (job postings)
- Products and Services – loss of:
  - Ability to timely respond to stakeholder requests
  - Occupational projections at a sub-state level
  - Industry and occupational analyses
  - Economic impact analysis for business recruitment or reemployment analysis
  - Reports customized to needs of state and local workforce boards and other customers
  - Special studies – such as those of underemployment, labor availability, program impact evaluation
  - GIS mapping for economic and workforce development
  - Publications and Web tools – such as career guides for secondary students and laid-off workers
- Staff – loss of:
  - Local labor market analysts
  - Staff needed to raise, or even maintain, data quality
  - Well-qualified staff attracted to better paying positions in the private sector
  - Ability of staff to improve capacity by attending training workshops and conferences
- Information Technology – inability to have:
  - State-of-the-art Internet data delivery systems
  - State-of-the-art software for data management and analysis
- Customer outreach – loss of ability to inform students, workers, educators, and employers about state LMI products and services

The WIAC's recommended FY2020 funding level of $142 million for BLS and $64 million for ETA reflects the increased congressional expectations as reflected in WIOA as well as expected inflation between 2017 and 2020. By enabling a robust federal-state WLMIS, the proposed infusion of new funds will lead to significantly more functional labor markets; substantial federal and state cost savings in unemployment compensation, disability payments, health care costs, retraining costs, student debt defaults, and criminal justice costs; and increased federal and state revenues as a result of higher worker earnings.

How This Can Be Implemented: The WIAC recommends that Secretary Acosta first direct the Labor Department's Chief Evaluation Officer to assess the public and federal return on investment in the proposed funding increase and then, in light of the findings, direct the Labor Department's Budget Office to prepare the Department's FY2020 budget request accordingly.

Recommendation 6

Overcome Barriers to Data Sharing

The WIAC recommends that the Secretary enable greater use of WLMI for evidence-based workforce investment decision making by supporting the implementation of relevant recommendations of the Commission on Evidence-Based Policymaking (CEP). Specifically, the WIAC encourages the Secretary to:

- provide constructive input and support to bipartisan congressional efforts to implement the overall framework proposed by the CEP;
- support implementation of CEP recommendation 2-6 regarding greater availability of state quarterly employee wage records for evidence-based policy research and analysis;[20] and
- support the capacity of state agencies to carry out evidence-based policy analysis and program evaluation using state administrative records linked to other administrative records by the federal government, consistent with CEP recommendation 4-1.[21]

Why This Is Needed: In his comments to the WIAC, Secretary Acosta expressed his desire to expand the Labor Department's capacity to measure the outcomes of federal employment and training programs, consistent with the Department's draft strategic plan for 2018-22 and President Trump's recent executive order directing outcome-based evaluations of all federal employment and training programs.[22] In its final report, *The Promise of Evidence-Based Policymaking*, the bipartisan CEP proposed a framework to improve "the availability of rigorous evidence to inform policymaking."[23] The CEP's recommendations and the legislation implementing them, such as the bills recently introduced by Speaker Paul Ryan and Senator Patty Murray and unanimously passed by the House in November 2017, provide a foundation for a well-functioning WLMIS to support evidence-based workforce development policymaking.

Access to employee UI wage records, obtained by the states through the state UI programs, is particularly important for evaluating the outcomes of education and training programs, such as apprenticeships, as noted in CEP recommendation 2-6. However, state agencies tend to err on the side of caution when considering sharing these confidential records, and other potentially invaluable administrative records created under federal-state cooperative programs administered by the Labor, Education, and Commerce departments, for purposes other than those expressly required for program administration. This inclination towards caution—a product of the uncertainty of clear authority to use the data for specified purposes and a responsible apprehension regarding their security when outside their control—limits availability of these records for research and the value created by the federal investments that support their creation.

CEP Recommendations 2-7 and 4-1 address this issue by recognizing the value of a "two-way street" through which these administrative records could be securely shared for statistical purposes. Under this framework, qualified researchers working for the states would gain access to linked datasets with cross-state data from a variety of programmatic sources to conduct evidence-based research and analysis. This secure framework would enable states to contribute their expertise in the unique characteristics of their data to improve the shared resource and quickly produce valuable new statistical products, while efficiently leveraging federal investments in cooperative programs to expand the potential for outcome-based program evaluations.

Administrative Records of Value for Federal and State Evidence-based Policymaking

- Federal employer and individual tax information
- Education and training records (including enrollment, courses completed, degrees and certificates completed, and financial aid from preschool to K-12 to post-secondary)
- Census Bureau records on households (particularly through the Decennial Census and American Community Survey)
- State Supplemental Nutrition Assistance Program (SNAP) records
- State Temporary Assistance for Needy Families (TANF) records
- State UI claims records
- State UI quarterly establishment and employee wage records
- Federal government and military employment and wage information
- State WIOA services information

How This Can Be Implemented: As noted, Speaker Paul Ryan and Senator Patty Murray are co-sponsoring legislation to implement the Commission's recommendations. The WIAC recommends that Secretary Acosta:

- support H.R. 4174 and S. 2046, Foundations for Evidence-Based Policymaking Act of 2017, the bipartisan bills to codify an initial set of CEP recommendations;
- obtain recommendations from the ETA Office of Workforce Security and the BLS Office of Employment and Unemployment Statistics regarding legislative and administration approaches to implementing CEP recommendation 2-6 on wider access to state UI wage records for statistical purposes, including BLS and ETA access to state wage records and state access to other states' wage records; and
- provide input to the congressional co-sponsors on 2018 bills to codify CEP recommendations, particularly recommendations 2-6 and 4-1.

Recommendation 7

Improve Consistency and Availability of Program Evaluation Data

The WIAC recommends that the Secretary improve the consistency and availability of workforce program assessment and evaluation data by establishing the state WLMI unit or other unit determined by the state as the designated state entity to oversee the production of WIOA workforce program participant outcomes, performance reports and evaluations.

Why This Is Needed: Designation of the state WLMI unit (or other qualified state entity) to provide WIOA workforce program participant outcomes, performance assessments, and evaluations would:

- provide the credibility to build upon existing resources and encourage state partner organizations to support WLMI analytical work, including providing financial support that could help ameliorate reduced federal funding;
- eliminate state duplication of effort which depletes valuable resources (e.g., each WIOA partner organization's hiring staff or contracting out for assessments and evaluations);
- bring greater rigor to state-conducted program assessments and evaluations and help the state build capacity to conduct rigorous program evaluations in support of WIOA; and
- further the WIOA mission of closer working relationships across mandatory partners.

WIOA emphasizes the need for rigorous program evaluation—at both the state and federal levels—to support evidence-based policymaking.[24] Important to this WIAC recommendation is the new requirement for states to conduct evaluations of the six core WIOA programs.[25] The law also emphasizes assessing and providing information on the success of specific training programs to support customer choice (e.g., identifying which providers on the state's Eligible Training Provider List for WIOA programs produce the best outcomes).

The administration has further stressed the need for evidence-based policymaking, program assessment and evaluation, and funding of what works through the President's Fiscal Year 2018 budget statements; President Trump's Executive Order 13801, June 15, 2017, "Expanding Apprenticeships in America", Section 10, which calls for rigorous evaluations of existing programs; and Office of Management and Budget agency directives such as *OMB M-17-28 on Fiscal Year 2019 Budget Guidance*, July 7, 2017, which calls for agency proposals on building and using a portfolio of evidence and strengthening agency capacity to use evidence, evaluation, and data as tools to improve federal government effectiveness[26]. Aligned with these, the DOL 2018-2022 draft strategic plan calls for the rigorous evaluation of workforce and training programs.[27] Critical to all of this is the determination of metrics that measure outcomes and success, the identification of what works or does not, and the incentivizing of what works through wise spending of taxpayer dollars.

As required under WIOA and state unified planning guidelines, all states have mechanisms in place to oversee the measurement and reporting of common measures and other program data to DOL via the Workforce Integration Performance System. In addition, through the use of discretionary grants from the DOL Workforce Data Quality Initiative and the ED State

Longitudinal Data System programs, many states have developed centralized state longitudinal datasets and mechanisms for conducting assessments and evaluations. However, other states have not made similar progress in obtaining, integrating, and/or analyzing a wide range of program outcome and related data, including the conduct of program assessments and evaluations.[28] For example, specific training programs provided by state entities such as corrections, economic development, vocational rehabilitation, and in some cases education lack the data needed to assess program outcomes and/or the expertise to conduct accurate and reliable program assessments and evaluations.

The entity to be designated should be up to the state; however, WLMI units, which routinely perform statistical and analytical functions with workforce data, would likely be best suited to conduct assessments and evaluations for a wide range of programs, given their role and capabilities. State WLMI divisions have access to significant amounts of data (e.g., program participant, earnings, and occupation and industry data, among others), can often gain access to other data as needed, are experienced with privacy and confidentiality laws and practices, and have the expertise to accurately and reliably integrate and analyze the data.

This WIAC recommendation aligns with the findings and recommendations of the September 2017 final report of the CEP, *The Promise of Evidence-Based Policymaking*, and recent legislation, *Foundations for Evidence-Based Policy Making Act of 2017*, passed by the U.S. House of Representatives (H.R. 4174) in mid-November 2017 and subsequently introduced in the Senate (S. 2046).[29] In particular, it is consistent with the Commission's recommendations to facilitate the use of data for evidence building while ensuring privacy and transparency in how those data are used. The federal entity proposed to be established to enable the provision of data for evidence-based policymaking and the state units designated for workforce program assessment and evaluation should establish a working relationship to address the state data access issues identified by the Commission.

How This Can Be Implemented: The Secretary should convene a working group of relevant federal program and legal staff to determine the appropriate approach for establishing the designation of a state entity to oversee the provision of program participant outcomes, performance assessments, and evaluations for workforce development programs under WIOA, and subsequently implement the designation through legislative and/or administrative actions as may be needed.

Recommendation 8

Create a 21st Century WLMI System Using Advanced Technologies

The WIAC recommends that the Secretary create a twenty-first century WLMIS based on a distributed knowledge management system (DKMS) that uses an open architecture/open data approach and artificial intelligence (AI) and related advanced technologies to:

- make WLMI more accessible, dynamic, up-to-date, and relevant for all users—jobseekers, employers, students, educators, workforce practitioners, researchers, and policymakers;
- transform the WLMIS so that it provides knowledge rather than large volumes of information and data to decipher, and moves from a system of separate, centralized datasets or databases to one based on the concept of distributed data;
- infuse the WLMIS with more intelligent knowledge systems aligned with new protocols and technologies for the emerging versions of the World Wide Web; and
- reduce the costs of software development, data production, and data maintenance.

Why This Is Needed: Given the rapid advancement of these technologies over the last few years[30] and the IT modernization goals of President Trump's Executive Order 13794, May 1, 2017, "Establishment of the American Technology Council",[31] the time is right for DOL to examine the application of such technologies to the WLMIS. AI and related technologies are currently being used in many private- and public-sector applications, such as self-driving vehicles, language translation, image recognition, trip planning, digital tutors, electronic health records management and research, financial and contract transactions, and medical diagnosis, to name a few (well-known implementations include IBM Watson or Amazon Alexa). Like investments in roads and bridges, innovative investments in the WLMIS are needed for these interrelated reasons.

- The current WLMI technological infrastructure—hardware, software, and Application Program Interfaces—is old and cannot efficiently handle today's user demands for easy-to-find, up-to-date, actionable data and insights.
- The current WLMIS uses closed database architectures and data ownership structures, which inhibit external application development, independent research, and public use of WLMI.
- Modernizing the WLMIS through use of state-of-the-art technologies will enable new and better ways to meet the information and data needs of users and stakeholders and increase government effectiveness in serving them.
- An AI-driven DKMS requires standardization of data structures important to the application of machine learning, which drives development and maintenance costs down over time and provides a simpler, more useful, and intuitive user experience.[32]

The proposed WLMI DKMS would not create a new set of data. An AI-driven DKMS would serve as a highly-sophisticated platform or interface that interacts with the underlying datasets, allows existing datasets to talk to one another, and provides users with a simpler, more useful, and intuitive way to obtain information. Underlying datasets would remain as is, except to the extent that common data structures/schemas are needed to facilitate the DKMS ecosystem.

How This Can Be Implemented: The WIAC acknowledges this to be a complex, long-term initiative, but also very important to the future of the nation's workforce system and economy. The five initial strategies outlined below will move this initiative to a pilot-test point, with initial system development and testing focused on one WLMI area—occupational data—to serve as the proof of concept. Occupational data, as the initial focus area, would include, for example, job postings, O*NET data, and OES and OOH information produced by BLS.

(1) Include the use of open architecture/data approaches identified in the DOL strategic IT plan. The DOL Chief Information Officer should be encouraged to include the use of such approaches in the *DOL 2018-2022 Information Resources Management (IRM) Strategic Plan*, thereby paving the way for the application of such technologies to WLMI.

(2) Establish a strategic planning and design task force under the auspices of the WIAC and in collaboration with ETA, BLS, and any existing DOL technology working group to: conduct a Request for Information process and other research to obtain expert design thinking; develop a strategic plan and design for the AI-driven, WLMI DKMS; determine parameters for initial system development and pilot testing (proof of concept) focused on occupational data, including specifications for a Request for Proposal (RFP); and obtain WIAC adoption and DOL approval for the plan/design and pilot test parameters. The task force should consist of employee experts drawn from DOL/ETA/BLS, one or two WIAC members, and representatives from user communities, and may include experts from university partnerships (see strategy #4, below).

(3) Conduct an initial system development/pilot test effort (proof of concept) through issuance of an RFP to obtain a qualified contractor. The assigned DOL program office should oversee the project and provide progress reports to the WIAC. Results will dictate next steps concerning further design, development, and deployment.

(4) Explore development of a public-private partnership with key universities active in AI research and application. Recognizing budget constraints, such partnerships could provide technical expertise to the task force.

(5) Obtain DOL budget resources to carry out the above activities. Federal resources—in-kind through federal staffing of the task force and hard dollars to provide general contractor support—would constitute the initial seed investments. The initial development/pilot effort may be funded under the provision for WIOA pilot, demonstration, and evaluation projects. The $500 million Technology Modernization Fund called for by the Modernizing Government Technology Act of 2017 may also provide a source of funding.[33]

Recommendation 9

Initiate Collaboration among WLMI System Agencies

The WIAC recommends that the Secretary initiate collaboration among WLMIS agencies by directing ETA and BLS to convene a gathering of representatives from federal and state programs that contribute information essential to a well-functioning workforce and labor market information system, as authorized by Congress.

The proposed meeting's purpose is to initiate WLMIS development. More specifically, the purpose is to:

- allow each federal WLMIS agency to obtain a full understanding of the data resources of other federal WLMIS agencies;
- promote relationship-building across federal and state WLMIS agencies; and
- discuss how representatives of these agencies might periodically gather to facilitate WLMIS design and implementation.

The WIAC recommends that the agencies listed in the box be invited by the Secretary to send program representatives to the meeting. For the Secretary's use in promoting well-functioning labor markets, the WIAC's conception of the federal and state agencies and programs in the WLMIS are identified in the schematic in the Appendix.

Agencies Recommended for Invitation to Initial WLMIS Meeting

Federal

- Bureau of Labor Statistics, U.S. Department of Labor
- Employment and Training Administration, U.S. Department of Labor
- Census Bureau, U.S. Department of Commerce
- National Center for Education Statistics, U.S. Department of Education
- National Center for Science and Engineering Statistics, National Science Foundation
- National Center for Health Workforce Analysis, U.S. Department of Health and Human Services

State

- State labor market information agencies (through the National Association of State Workforce Agencies' LMI Committee and the LMI Institute)
- State higher education agencies (through the Education Commission of the States)

Why This Is Needed: WIOA directs the Secretary to "oversee the development, maintenance, and continuous improvement of a workforce and labor market information system" with specific capabilities that support labor market decision making and research at the national, state, and local levels.[34]

WIOA further directs the Secretary to develop and maintain the WLMIS:

- through BLS and ETA;
- in collaboration with states;
- in cooperation with other federal agencies, to ensure complementarity, and eliminate data gaps and duplication; and
- in consultation with the WIAC.[35]

In addition, the successful implementation of the multiple programs authorized by WIOA depends on the availability of current, reliable data on "in-demand occupations and industries" at the state and local level.[36] Congress has directed that the WLMIS supply this information.[37] According to the DOL's FY2018 budget request, it spent $9.2 billion in FY2017 to support its set of employment and training programs. Effective, efficient federal spending on employment and training depends on current, reliable workforce and labor market information.

How This Can Be Implemented: The WIAC recommends that ETA and BLS create a small group to plan the initial meeting of primary contributors to the WLMIS. The WIAC further recommends that the planning group consider consulting with the WIAC regarding invitations, agenda, topics for discussion, and process; seek to arrange for welcome addresses from the Secretary and BLS and ETA leadership; and seek to issue invitations from the Secretary in the first quarter 2018.

Appendix

About the Workforce Information Advisory Council

The Workforce Innovation and Opportunity Act of 2014 (WIOA) established the Workforce Information Advisory Council (WIAC) to advise the Secretary of Labor on the federal-state workforce and labor market information system—how well it is currently working, what improvements are needed, and how federal and state government can enhance cooperation in managing the system.[38] The Council, consisting of fourteen members representing a broad mix of knowledge and public and private sector interests, was chartered and convened in 2016 under the auspices of the Employment and Training Administration in collaboration with the Bureau of Labor Statistics.

The Act affirms and expands the nation's commitment to a robust information system—a system of employment and labor market statistical programs that dates to the 1940s. Today it supports a wide range of labor market decision makers with an extensive array of data, tools, and resources. The Act emphasizes that national, state and local workforce information be developed, disseminated, and used to:

- improve the functioning of state and local labor markets by providing labor market participants—businesses, workers, students, and educators—the information they need to make good decisions; and
- support workforce system decisions concerning the designation of local workforce areas, development of regional workforce plans, identification of in-demand industries and occupations, development of workforce system performance measures, and allocation and targeting of federal workforce development funds.

The Act requires the Secretary of Labor to formally consult with the WIAC regarding evaluation and improvement of the nationwide workforce and labor market information system and statewide systems that comprise the nationwide system, and how the DOL and the states will cooperate in the management of those systems.

In addition, the Act strengthens the governance structure for the nation's workforce and labor market information system by:

- giving ETA shared responsibility, with BLS, for the federal leadership and management of the system;
- emphasizing the requirement that the Secretary of Labor develop a two-year plan for the improvement of the system; and
- establishing the WIAC to provide direction and feedback on labor market information effectiveness and customer needs.

Importance of Workforce and Labor Market Information

Workforce and labor market information is essential to the nation's economy, providing for the efficient operation of labor markets by supplying quality labor market intelligence. *Accurate, objective, relevant, timely, and accessible* workforce and labor market information is critical for:

- building a skilled workforce that spurs business competitiveness and economic growth;
- strengthening career pathways and guiding skill attainment for good jobs, economic opportunity, and career growth;
- understanding the rapidly changing nature of work and how it impacts the workforce and U.S. economy; and
- making evidence-based decisions on investments in workforce training and education.

The nation's labor markets cannot function efficiently and effectively without quality information to support the investment decisions of the workforce development system—federal and state policymakers; state and local workforce development boards; federal, state, and local government agencies; and frontline staff—and the investment decisions of business managers, students, jobseekers, workers, and educators.

An emphasis on evidence-based policymaking, program assessment and evaluation, and funding of what works has been made through Administration directives such as Section 10 of the President's Executive Order on "Expanding Apprenticeships in America," which specifically addresses improving the effectiveness of workforce development programs, and actions by Congress to implement the recommendations of the Commission on Evidence-based Policymaking. The WLMIS provides the fundamental data and information needed to support these and other administration and congressional priorities.

The workforce and labor market information system collects, analyzes, and disseminates a wide range of information, from principal employment statistics such as unemployment rates and job levels to complex analyses of topics such as in-demand occupations and rural employment challenges. The system serves a broad range of customers, including businesses and industries; jobseekers, students, and workers; educators, counselors, and training providers; and government policymakers and planners.

The current WLMIS consists of the products of many rigorous surveys and data collections, administrative data systems, and analytical resources and tools, primarily produced by the DOL (BLS, ETA), state LMI agencies, and the U.S. Department of Commerce (Census Bureau).

Examples of Existing Resources

Rigorous Surveys/Data Collections

- Occupational Employment Statistics (OES)
- Current Employment Statistics (CES)
- Local Area Unemployment Statistics (LAUS)
- Quarterly Census of Employment & Wages (QCEW)
- Employment Projections (EP)
- Occupational Information Network (O*NET)
- Current Population Survey (CPS)
- American Community Survey (ACS)
- Local Employment Dynamics (LED)

Administrative Data Systems

- State Workforce Data Quality Initiative systems
- Business Employment Dynamics
- Local Employment Dynamics

Information Tools

- Occupational Outlook Handbook
- MyNextMove
- MySkills MyFuture
- OnTheMap

Existing data and information sources, provided through shared responsibility and funding for the federal-state WLMI infrastructure, are critical to maintain. Improvements are needed, however, to address key issues concerning data quality, data gaps, data accessibility for end users, data sharing among core producer agencies, and expanding collaboration to include others such as the U.S. Department of Education, National Science Foundation and the Internal Revenue Service.

Council Development of Recommendations

The Workforce Information Advisory Council accomplished its work following Federal Advisory Committee Act procedures, including holding eight public Council meetings—July 2016, November 2016, January 2017 (virtual), February 2017 (virtual), June 2017, November 2017, and January 2018 (two virtual meetings)—and posting meeting documents, written public comments, and related documents to the WIAC public website. The Council's initial work involved identifying key opportunity areas for improvement to the WLMIS.

- Align Education and Workforce Training with Industry Needs
- Inform Career Decisions of Students and Workers
- Determine the Effectiveness of Workforce Training and Education Programs
- Understand the Characteristics of the Workforce
- Make Workforce and Labor Market Information More Accessible and Relevant to End Users
- Enhance Government Data Sharing, Collaboration, and Funding among Statistical Agencies

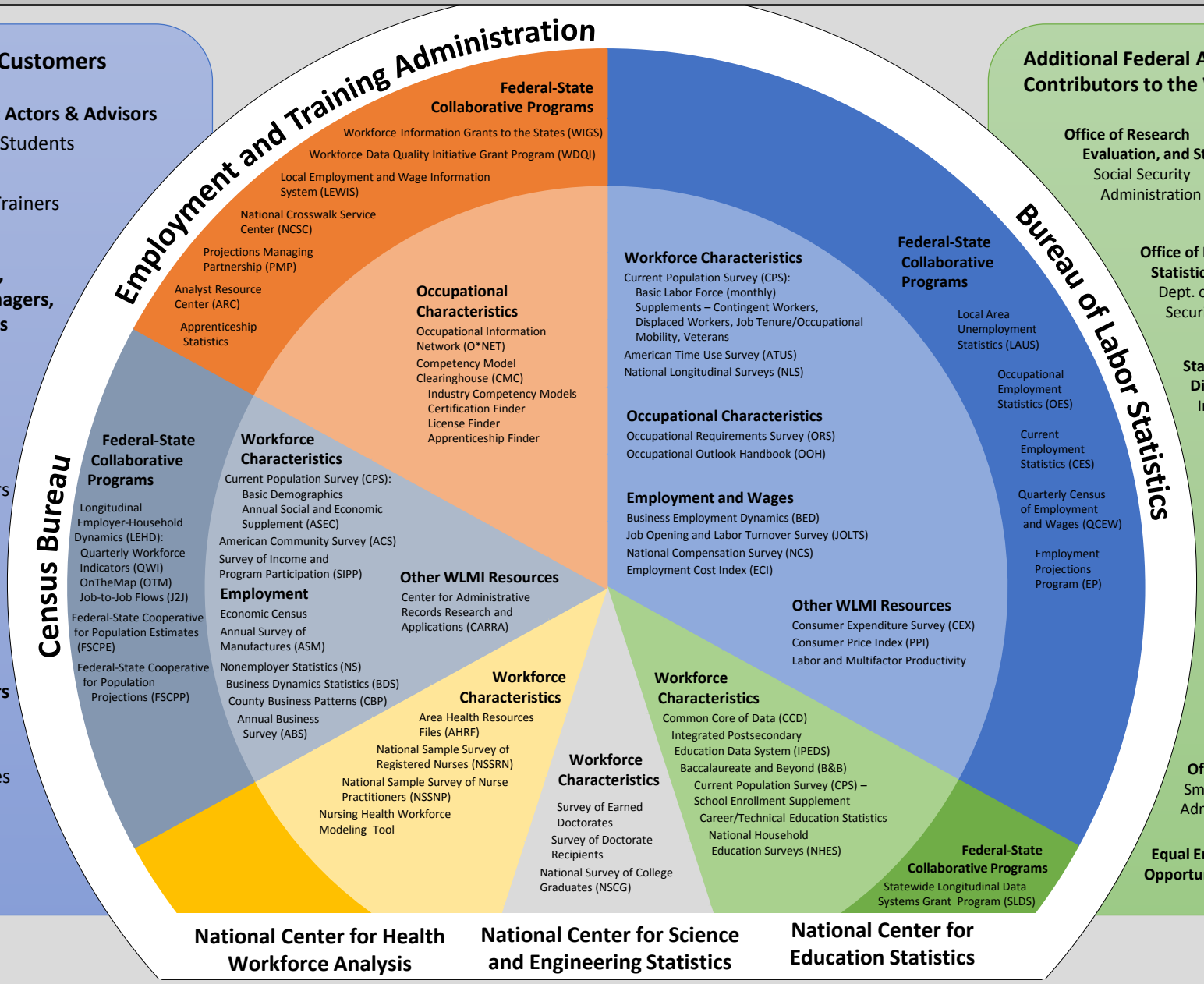
The Council submitted an informational report to the Secretary of Labor in July 2017 outlining these areas, which were further examined through a subcommittee process established during the June 2017 WIAC meeting. Council subcommittees conducted a total of 36 work sessions to further the members' understanding of specific WLMI areas of interest. Through subsequent Council and subcommittee meetings and deliberations, including discussions with subject matter experts, reviews of relevant programs and products and related materials, and consideration of public comments received, the Council more thoroughly examined key subjects, culminating in the adoption of its recommendations for improving the WLMIS.

Schematic of the WLMI System

The schematic on the following pages shows the primary federal and state agencies and programs in the WLMIS.

Federal-State Workforce and Labor Market Information System (WLMIS)

Prepared by the Secretary of Labor's Workforce Information Advisory Council (WIAC)



WLMI Customers

Labor Market Actors & Advisors
- Jobseekers & Students
- Businesses
- Educators & Trainers
- Counselors

Policymakers, Program Managers, & Researchers
- Workforce Developers
- Economic Developers
- Education Administrators
- Academic Researchers
- Human Services Professionals

Value-Added Disseminators
- Media
- Data Intermediaries

Additional Federal Agency Contributors to the WLMIS

Office of Research Evaluation, and Statistics
Social Security Administration

Office of Immigration Statistics
Dept. of Homeland Security

Statistics of Income Division
Internal Revenue Service, Dept. of Treasury

Bureau of Economic Analysis
Dept. of Commerce

Economic Research Service
Dept. of Agriculture

Office of Advocacy
Small Business Administration

Equal Employment Opportunity Commission

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Federal-State Workforce and Labor Market Information System (WLMIS)

Program Details, by Agency and Category

Employment and Training Administration

Resource	Freq.	Geog.*	Key Data
Federal-State Collaborative Programs			
Workforce Information Grants to the States (WIGS)	Annual	State	Grants that support state LMI agencies
Workforce Data Quality Initiative Grant Program (WDQI)	Annual	State	Grants to support development of longitudinal workforce databases
Local Employment and Wage Information System (LEWIS)	Annual	Custom	Supports state agencies estimating local employment and wage levels
National Crosswalk Service Center (NCSC)	Varies	National	SOC and NAICS crosswalks to other systems
Projections Managing Partnership (PMP)	Annual	State	Supports state agencies making employment projections
Analyst Resource Center (ARC)	Varies	National	Maintains a standardized LMI database structure states may use
Apprenticeship Statistics	Annual	State	Statistics on registered apprenticeship programs
Occupational Characteristics			
Occupational Information Network (O*NET)	Rolling	National	Maintains database of occupational descriptions and related tools
Competency Model Clearinghouse (CMC): Industry Competency Models, Certification Finder, License finder, Apprenticeship Finder	Rolling	National	Models of the KSAs needed by employees in selected industries and tools to find relevant certifications, licenses and apprenticeships

Census Bureau

Resource	Freq.	Geog.*	Key Data
Federal-State Collaborative Programs			
Longitudinal Employer-Household Dynamics (LEHD): Quarterly Workforce Indicators (QWI), OnTheMap (OTM), Job-to-Job Flows (J2J)	Quarterly	Neighbor-hood	Employment, commuting and employment pattern data with tools for reporting, analysis and mapping
Federal-State Cooperative for Population Estimates (FSCPE)	Annual	Place	Population estimates updating decennial base counts.
Federal-State Cooperative for Population Projections (FSCPP)	Varies	State	Estimates illustrating possible courses of population change; state level projections available from respective states
Workforce Characteristics			
Current Population Survey (CPS): Basic Demographics; Annual Social and Economic Supplement (ASEC)	Annual	State	National population demographics with an annual supplement for detailed information on employment by occupation, education, etc.
American Community Survey (ACS)	Annual	Neighbor-hood	Employment by occupation and educational attainment
Survey of Income and Program Participation (SIPP)	Annual	National	Movement into and out of government transfer programs
Employment			
Economic Census	Quin-quennial	County	Comprehensive information about establishments
Annual Survey of Manufactures (ASM)	Annual	State	Sample estimates of statistics for all manufacturing establishments
Nonemployer Statistics (NS)	Annual	County	Self-employment
Business Dynamics Statistics (BDS)	Annual	MSA	Changes in number of establishments and jobs over time
County Business Patterns (CBP)	Annual	County	Economic data by industry
Annual Business Survey (ABS)	Annual	National	Employer business owner demographics, R&D, and financial information
Other WLMI Resources			
Center for Administrative Records Research and Applications (CARRA)	—	—	Conducts a variety of research using administrative data

National Center for Health Workforce Analysis

Resource	Freq.	Geog.*	Key Data
Workforce Characteristics			
Area Health Resources Files (AHRF)	Varies by Source	County	Health workforce data compiled from a variety of sources
National Sample Survey of Registered Nurses (NSSRN)	Quad-rennial	State	Trends and projections of the future supply of nursing resources
National Sample Survey of Nurse Practitioners (NSSNP)	2012	National	Estimates for the nurse practitioner workforce
Nursing Health Workforce Modeling Tool	—	State	Tool for analyzing and predicting supply and demand for nurses

Bureau of Labor Statistics

Resource	Freq.	Geog.*	Key Data
Federal-State Collaborative Programs			
Local Area Unemployment Statistics (LAUS)	Monthly	City	Employment and unemployment for smaller areas
Occupational Employment Statistics (OES)	Annual	MSA	Annual nonfarm jobs held, by occupation and industry
Current Employment Statistics (CES)	Monthly	MSA	Monthly nonfarm jobs held by industry
Quarterly Census of Employment and Wages (QCEW)	Quarterly	County	Quarterly jobs held, earnings, no. of establishments by industry
Employment Projections Program (EP)	Annual	National	Employment projections, with state estimates prepared by each state
Workforce Characteristics			
Current Population Survey (CPS): Basic Labor Force Statistics; Supplements: Contingent Workers, Displaced Workers, Job Tenure/Occupational Mobility, Veterans	Monthly	State	Employment, unemployment, labor force participation (monthly), with supplements providing additional detail on specific workforce segments on an annual, biennial, or other basis
American Time Use Survey (ATUS)	Annual	National	Amount of time spent on various activities: work, leisure, etc.
National Longitudinal Surveys (NLS)	Longitudinal	National	Repeated surveys of select groups over time on a variety of topics
Occupational Characteristics			
Occupational Requirements Survey (ORS)	Annual	National	Typical requirements for occupations
Occupational Outlook Handbook (OOH)	Biennial	National	Characteristics and employment outlook for hundreds of occupations
Employment and Wages			
Business Employment Dynamics (BED)	Quarterly	State	Job gains and losses over time
Job Opening and Labor Turnover Survey (JOLTS)	Monthly	National	Job openings, hires, and separations, labor demand gaps
National Compensation Survey (NCS)	Quarterly	MSA	Employer costs for compensation over time
Employment Cost Index (ECI)	Quarterly	MSA	Change in labor costs over time
Other WLMI Resources			
Consumer Expenditure Survey (CEX)	Annual	MSA	Information on the buying habits of America's consumers
Consumer Price Index (CPI)	Monthly	MSA	Average change in prices of consumer goods and services over time
Labor Productivity and Costs (LPC) and Multifactor Productivity (MFP)	Annual/ Quarterly	National	Output per labor hour (LPC) or combined inputs (MFP) by industry and sector

National Center for Education Statistics

Resource	Freq.	Geog.*	Key Data
Federal-State Collaborative Programs			
Statewide Longitudinal Data Systems Grant Program (SLDS)	Rolling	School	Grants to support development of longitudinal student databases
Workforce Characteristics			
Common Core of Data (CCD)	Annual	School	Attendance levels for primary and secondary schools
Integrated Postsecondary Education Data System (IPEDS)	Annual	Institution	Graduation rates by program for postsecondary institutions
Baccalaureate and Beyond (B&B)	Quad-rennial	Institution	Academic and labor market outcomes, by postsecondary program of study
Current Population Survey (CPS): School Enrollment Supplement	Annual	State	Demographics and school enrollment and educational attainment for elementary, secondary, and postsecondary education
Career and Technical Education (CTE) Statistics	Rolling	National	Comprehensive data on CTE from various sources
National Household Education Surveys (NHES)	Varies	National	Various topics, including non-degree credential attainment

National Center for Science and Engineering Statistics

Resource	Freq.	Geog.*	Key Data
Workforce Characteristics			
Survey of Earned Doctorates (SED)	Annual	National	Education, demographics and plans for all research doctorate recipients
Survey of Doctorate Recipients (SDR)	Biennial	National	Characteristics of science, engineering and health doctorate degree holders
National Survey of College Graduates (NSCG)	Biennial	National	Labor market outcomes for postsecondary graduates

* Smallest geographical area for which estimates/data are available.

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Endnotes

[1] Workforce and Labor Market Information System, *29 U.S.C. § 49l-2*. The WLMIS is to include data on employment opportunities and conditions at the state and local level, including the demand for individual occupations.

[2] *WIAC Charter*, July 20, 2017.

[3] Alexander Acosta and Virginia Foxx, "*College isn't always the best path for teens*," *The Charlotte Observer*, November 9, 2017. "When Americans make career choices, they should be encouraged to consider a broad range of options that fit their diverse talents and interests. . . . We encourage leaders in middle school and high school education to reconsider the different ways they disproportionately judge student success through college acceptance rates. Instead, the priority should be putting students on a path to career success—whether that is a university degree, a community college, or a workforce program. We need to close the 'career awareness gap.' Schools should show students the wide range of career options available to them, with details like salary information and educational requirements of those options. Students deserve a fuller picture when they make important career decisions."

[4] U.S. Department of Labor, *Draft Fiscal Year 2018-2022 Strategic Plan*, October 30, 2017, Secretary's Message: "Currently, there are more than six million job seekers and more than six million job openings in our nation. Yet, we have a 'skills gap'—the difference between skills job creators need and the skills job seekers offer, leaving too many jobs open."

[5] *Workforce Innovation and Opportunity Act (PL 113-128)*, Secs. 116(e) and 169 address state and federal requirements for evaluation of employment and training programs; President Donald Trump, Executive Order 13801, *"Expanding Apprenticeships in America,"* June 15, 2017, Sec. 10(c): "The head of each agency administering one or more job training programs shall order, subject to available appropriations and consistent with applicable law, an empirically rigorous evaluation of the effectiveness of such programs, unless such an analysis has been recently conducted." Secretary Acosta's comments to the WIAC, November 2, 2017: "We must focus on outputs rather than inputs." *DOL Draft FY 2018-2022 Strategic Plan,* Objective 1.1: "ETA will collaborate with the Chief Evaluation Office to rigorously evaluate workforce and training programs and strategies and promote adoption of proven programs and strategies."

[6] Andrew Kreighbaum, *"Is DeVos Devaluing Degrees? Education secretary calls for more emphasis on work-force training*," *Inside Higher Ed*, November 28, 2017. Louis Soares, Jonathan S. Gagliardi, Christopher J. Nellum, "*The Post-Traditional Learners Manifesto Revisited: Aligning Postsecondary Education with Real Life for Adult Student Success*," American Council on Education, December 6, 2017.

[7] McKinsey Global Institute, *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation,* December 2017.

[8] Workforce Information Council, *Enhancing Unemployment Insurance Wage Records: Potential Benefits, Barriers, and Opportunities,* September 2015. Copy obtained from BLS.

[9] U.S. Department of Labor*, FY2016 Congressional Budget Justification, Employment and Training Administration.*

[10] *Credential Engine.*

[11] Cyberseek, *Cybersecurity Supply/Demand Heat Map*.

[12] BLS Economic News Release, "*Employment and Unemployment Among Youth Summary*," August 16, 2017.

[13] Teresa Morisi, "*Teen labor force participation before and after the Great Recession and beyond*," *Monthly Labor* Review, BLS, February 2017, and Mitra Toossi, "*Labor force projections to 2022: the labor force participation rate continues to fall*," *Monthly Labor Review*, BLS, December 2013.

[14] U.S. Government Accountability Office, "*Contingent Workforce: Size, Characteristics, Earnings, and Benefits*," GAO-15-168R, April 20, 2015.

[15] Lawrence Katz and Alan Krueger, "*The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015*." (working paper, Harvard University/Princeton University/NBER, March 29, 2016).

[16] Robert McGuire, "*Ultimate Guide to Gig Economy Data: A Summary of Every Freelance Study We Can Find*," *Nation1099*, July 17,2017.

[17] Accenture, *Technology Vison 2017,* pp. 45-57.

[18] Highlighted WIOA text of mandated uses of "in-demand occupations and industries" and other WLMI is available *here*. Implementation of Education Secretary DeVos's *Proposed Priority 3* for discretionary grants—"Fostering Flexible and Affordable Paths to Obtaining Knowledge and Skills"—is to be determined by "employment in an in-demand industry sector or occupation (as defined in section 3(23)(A) of the Workforce Innovation and Opportunity Act of 2014)."

[19] Annual tables on WIGS from PY2001 to PY2017, by state, are available *here*. Data on annual BLS labor force statistics grants to states was provided by the BLS budget analyst. The adjustments for inflation were made using the chain-type price index for added value by industry for state and local government obtained from the U.S. Bureau of Economic Analysis.

[20] CEP, *The Promise of Evidence-based Policymaking,* September 2017, pp. 44-45: "The Congress and the President should enact statutory or other changes to ensure that state-collected administrative data on quarterly earnings are available solely for statistical purposes. The data should be available through a single federal source for solely statistical purposes. . . . Creating a single system to which states report UI wage record data could reduce the burden on states, who currently report the same data to multiple entities, and could reduce the burden on federal agencies that spend a significant amount of resources negotiating multiple agreements and memoranda of understanding with the states. A single system also could streamline access to this highly valuable data source for statistical activities, while enhancing the security and privacy of the data through development of standardized procedures for data submission and access."

[21] CEP*, The Promise of Evidence-based Policymaking,* p. 83. "The NSDS [National Secure Data Service] should . . . have the capacity to provide technical services such as secure data linkage and analytical services on a fee-for-service basis for states, local governments, and other jurisdictions. While technical and analytic services should not be an initial priority for the NSDS, a basic level of such services may be both necessary and desirable in the long term to *help improve the capacity for evidence building throughout the nation and to encourage collaboration across levels of government*." (emphasis added).

[22] *DOL Draft FY 2018-2022 Strategic Plan,* p. 8. *Secretary* Acosta's draft strategic plan states: "*Implement evidence-based programs and strategies* – ETA will collaborate with the Chief Evaluation Office to rigorously evaluate workforce and training programs and strategies and promote adoption of proven

programs and strategies." Executive Order 13801, *"Expanding Apprenticeships in America,"* Sec. 10. Improving the Effectiveness of Workforce Development Programs.

[23] CEP, *The Promise of Evidence-based Policymaking*, p. 1. "The Commission on Evidence-Based Policymaking . . . envisions a future in which rigorous evidence is created efficiently, as a routine part of government operations, and used to construct effective public policy."

[24] *WIOA*, Sec. 116(e), Evaluation of State Programs, and Sec. 169, Evaluations and Research.

[25] *WIOA*, Sec. 116(b), State Performance Accountability Measures.

[26] Executive Order 13801*, "Expanding Apprenticeships in America,"* June 15, 2017; OMB-17-28, "*Fiscal Year 2019 Budget Guidance*," July 7, 2017.

[27] *DOL Draft FY 2018-2022 Strategic Plan*.

[28] See, e.g., the National Association of State Workforce Agencies (NASWA) report, "*Evidence-Building Capacity in State Workforce Agencies,*" February 2017. This report, based on a state scan and two state case studies, provides a current and comprehensive look at state capacity to conduct workforce assessments and evaluations.

[29] CEP, *The Promise of Evidence-based Policymaking. Foundations for Evidence-Based Policy Making Act of 2017*, *H.R. 4174* and *S. 2046*, 115th Cong. (2017)

[30] See, e.g., 2016 reports by the *National Science and Technology Council* (NSTC, *Preparing for the Future of Artificial Intelligence* and *The National Artificial Intelligence Research and Development Strategic Plan,* and the May 2014 report on *Big Data and Privacy: A Technological Perspective,* and others at the *Office of Science and Technology Policy* (OSTP). See also various advanced technologies such as: open-source software (Android, Linux); open-source development/collaboration (GetHub); open-crowd product development/collaboration (Quirky); open innovation (Innocentive); open Application Program Interfaces-APIs (Google Maps, Open AI); and blockchaining. See also, e.g., *Google for Jobs,* which is using AI to provide jobseekers and employers with an improved job-matching experience and *Google Cloud Jobs API,* which is using two main proprietary ontologies that encode knowledge about occupations and skills and relational models based on an enhancement of the O*NET Standard Occupation Classification system. Two interesting articles that discuss the application of such advanced technologies include: James Arbib and Tony Seba, "*Rethinking Transportation 2020-2030*," *Rethink X*, May 2017, and Rob Marvin, "*Blockchain: The Invisible Technology That's Changing the World*," *PC Magazine*, August 29, 2017.

[31] Executive Order 13794, "*Establishment of the American Technology Council*," April 28, 2017, states: "It is the policy of the United States to promote the secure, efficient, and economical use of information technology to achieve its missions. Americans deserve better digital services from their Government. To effectuate this policy, the Federal Government must transform and modernize its information technology and how it uses and delivers digital services." The Council, consisting of Federal cabinet department and agency heads, was formed to implement that policy.

[32] Examples of systems working toward standardization for distributed or public use include: (a) electronic health record standardization for public/private institutional use under highly constrictive HIPPA compliance regulations (Health Insurance Portability and Accountability Act); (b) global financial institutions' Legal Entity Identifiers (LEI) as regulated by the LEI Regulatory Oversight Committee*;* and (c) HHS' Patient Centered Outcomes Research (PCOR) multi-pronged effort involving a PCOR Institute

(PCORI) and Network (PCORN) of healthcare institutions focused on developing data infrastructure standards to support data access/data sharing, privacy and security issues concerning data research, and open, standardized application programming interfaces, to name a few of their current projects. See also *www.schema.org,* established to create, maintain, and promote open source schemas for structured data, founded by Google, Microsoft, Yahoo, and Yandex.

[33] The *National Defense Authorization Act for Fiscal Year 2018* (PL 115-91) was signed into law on December 12, 2017, and includes the provisions of the Modernizing Government Technology Act of 2017 as an amendment. See *PL 115-91*, Title X, Subtitle G, Sec. 1076-1078.

[34] See *29 U.S.C. § 49l-2(a)*, WLMIS, System Content.

[35] See *29 U.S.C. § 49l-2(b)*, WLMIS, System Responsibilities.

[36] Highlighted WIOA text of mandated uses of "in-demand occupations and industries" and other WLMI is available *here*.

[37] According to *29 U.S.C. § 49l-2(a)*, "The Secretary . . . shall oversee . . . a nationwide workforce and labor market information system that includes . . . statistics on . . . current and projected employment opportunities, wages, benefits (where data is available), and skill trends by occupation and industry, with particular attention paid to State and local conditions . . . ."

[38] Workforce and Labor Market Information System, *29 U.S.C. § 49l-2*.