**Creating a Timely, Local, and Actionable Workforce and Labor Market Information System**

**for the 21st Century**

**The Challenge:** The pace of change in the economy is accelerating, caused by demographic shifts in the labor force, government investments, and rapid technological advancements. Available workforce and labor market information (WLMI) tools are unable to help us capture how these changes affect demand. As a result, labor market analysts are unable to help their stakeholders – career seekers, employers, labor unions, government agencies, and education/training providers – make timely, local, and actionable education, career, policy, and strategic program decisions. The (WLMI) system needs new data sources, methodologies, and tools to inform the public, equip public and private sector decision-makers, and evaluate the effectiveness of workforce and educational investments.

**The Opportunity:** The WIAC also recognizes that the WLMI system is at a unique moment in time enabling it to meet these challenges in ways that were previously unimaginable. Compute power is many orders of magnitude greater and far less costly than it was merely a decade ago, enabling governments to manage and quickly analyze ever larger amounts of data. Artificial intelligence (AI) is more advanced and accessible so that it is now possible and realistic for governments to use methods like machine learning and natural language processing to generate insights and create tools to solve pressing problems. Finally, more data is generated than ever through smart devices, the cloud, and the internet, some of which can serve as the ingredients for generating useful insights about the labor market in close to real time.

**Goal:** The WIAC calls for a transformation of the WLMI system into one that leverages existing survey and administrative data in new ways, blends them with other data sources, and applies new methodologies to produce timely, local, and actionable insights on labor market trends.

**Findings:** The WIAC members observe multiple limitations of the current WLMI system, including:

**Current data are not useful for local WLMI purposes**

* Most key WLMI data comes from surveys which have become more expensive and difficult to conduct successfully over recent years.[[1]](#footnote-1) For example, the Current Population Survey’s response rate reached a high of 92 percent in 2010 and decreased dramatically to 69.6 percent in 2024.[[2]](#footnote-2) As the cost of survey administration rises and response rates fall, what state, local, or tribal data we have traditionally had becomes increasingly less reliable. In addition, national labor force surveys use methods and concepts developed almost 100 years ago.[[3]](#footnote-3) WLMI users need more timely, local, and actionable data.
* There is very limited data on credential and skill requirements, and what data is available is usually national, not local. This leaves economic developers, employers, and individuals without the tools they need to make informed decisions in a rapidly changing labor market

**Timeliness and quality of administrative records have not improved**

* Lags in the reporting of data degrade its utility. While some lag is unavoidable, delays in data availability limit the utility of that data once it is produced. For example, the latest Occupational Employment and Wages Statistics (OEWS) published in April 2024 are estimates for May 2023 – the most current data was already nearly one year out-of-date at publication and will be nearly two years old when it is updated in 2025 to reflect 2024 data.

**Nontraditional sources of data have not been sufficiently explored and valued**

* There are many private and public sector approaches to capturing information about the demand for skills in the labor market. For example, proprietary services like those that scrape, parse, and analyze online job ads, for paid licensees, offer a glimpse of what is possible when it comes to understanding the ebb and flow of skill demand. As stewards of WLMI, however, the WIAC believes that such a service should not be completely ceded to private sector sources whose primary interests may not be fully aligned with stakeholder needs.
* Several states have linked their education and workforce data in an effort to characterize the supply of skills in the labor market. This approach should be further explored.
* The U.S. Census Bureau has been developing a Post-Secondary Employment Outcomes (PSEO) Explorer, but that effort is lagged further than other sources (2020 data is the latest available). Moreover, the Census Bureau’s differential privacy approach limits the utility of this data for decision-making, especially at the local level. Finally, the PSEO business model does not empower state, local, and tribal governments to work with their own data to develop tools that are responsive to their stakeholders’ unique needs.

**Recommendations to build a foundation for enhanced and accessible WLMI data**

**The U.S. Secretary of Labor should:**

**Invest in new and useful sources of data**

**1. Strengthen the coverage and accuracy of the National Labor Exchange (NLx), so that it can serve as a low- or no-cost foundation for real-time labor market information products to be developed by the states.**

Job postings serve as an early indicator of changes in skill demand. The **National** **Labor** **Exchange** (NLx) is an electronic network that connects employers and jobseekers across the U.S. It offers state workforce agencies no-cost services such as job banks, analytics, and military hiring programs. NLx has the potential to be a key foundational element in providing data that can support a more real-time, geographically granular, and skills-based WLMI system. As a publicly accessible job board, it can be a central source for online job advertisements that have a common data structure. Application Programming Interface (API) connections using the data are already available through CareerOneStop. Direct access to NLx data is also made available through the NLx Research Hub. In particular, the WIAC recommends that the Secretary:

a. Contract with a vendor to undertake a widespread marketing and adoption campaign to encourage full reporting of job listings;

b. Coordinate with the U.S. Department of Commerce, U.S. Department of Energy, and other federal departments to place a requirement that all jobs made possible through funding provided through the Bipartisan Infrastructure Law, the Inflation Reduction Act, and the CHIPS and Science Act be listed on NLx;

c. Include a line item in the U.S. Department of Labor’s budget that directly funds NLx’s maintenance, operations, and the expansion of its capabilities;

d. Contract with the National Association of State Workforce Agencies’ (NASWA) NLx Research Hub, and either the U.S. Digital Service or a private sector technology partner, to clean, parse, and standardize NLx data. This effort will make NLx data accessible to natural language processing allowing for identification, extraction, and standardization of detailed work activities and the skills necessary to complete them;

e. Issue a competitive grant opportunity to develop one or more proof-of-concept products using NLx, such as labor market information tools that can be used to identify the changing demand for skills as they emerge or decline; and

f. Require that all state and local recipients of federal workforce dollars are sending their first-party job postings to NLx to increase its completeness and local application and provide a common foundation to build tools that stakeholders and WLMI consumers can use in any state, local, or tribal area.

**2. Encourage and incentivize open, innovative, and actionable information, reports, and dashboards resulting from collaborative work among the state partners in the Workforce Innovation and Opportunity Act (WIOA) and WLMI communities.**

a. In looking toward a modernized WLMI system, sharing not only finished products but also the processes used to create them empowers labor market analysts to replicate or build their tools. This can be modeled by the Bureau of Labor Statistics (BLS) and the Employment and Training Administration (ETA) in their analyses,[[4]](#footnote-4) by developing products built using an updated BLS API based on Recommendation #6 that are replicable by outside users, as well as by including details on how to replicate analyses they create.[[5]](#footnote-5)Open sharing of products and processes can serve to elevate how all state, local, and tribal areas provide WLMI, and not just the few with the resources to produce them.

b. Further, the Secretary should recognize and encourage the adoption of innovative strategies by state, local,and tribal areas. Examples currently include the use of open-source software, the formation of data collaboratives, conducting training in advanced analytical and visualization techniques, and creating peer-to-peer data sharing and data analysis support groups. Vehicles for the Secretary to encourage adoption may include Workforce Data Quality Improvement grants, direct underwriting supporting the Multi-State Data Collaborative, and support for advanced data linkage, visualization, and analytics training.

c. The Secretary should fund a project that will enable and assist state, local, and tribal governments to replicate the machine-learning driven, online career navigation tools such as those implemented by Arkansas, Hawaii, New Jersey, Rhode Island, and Virginia. The code and project management tools used to develop this application are available on a free, open-source platform that allows future product developers to replicate or adapt these tools.

**3. Develop a national data sharing partnership with the U.S. Department of Transportation and their state counterparts to match and leverage demographic data collected from motor vehicle license applications with state payroll administrative data collected in the Unemployment Insurance (UI) program.**

All states collect demographic data as part of their motor vehicle licensing program. Some states enter data sharing agreements. A formal collective collaboration at the national level would assist states to more securely and effectively leverage these important data elements to serve customers in education, business, labor, and more and better understand how access and outcomes may differ by age and sex.

This effort could be accomplished using the BLS Wage Records Program as the data matching and leveraging vehicle. BLS already has the legal and technical infrastructure to support a collaborative like this for around 30 partner states.

**Use new sources of data to produce WLMI that is local, timely, and actionable**

**4. Test the potential to measure the impact of local labor market shocks, like the COVID-19 pandemic, the advent of artificial intelligence, and large-scale investments in infrastructure on skill demand and career transitions. The test should be through a pilot WLMI development program and transparent evaluation process.**

The WLMI development program should launch one or more pilot projects that leverage existing survey and administrative data in combination with a variety of other sources to identify the nature of the demand for skills by occupation. Any project of this type should consider that the nature of skill requirements will likely vary from local labor market to local labor market.

This work should be built upon the foundational elements recommended above including a more robust and machine-readable version of NLx, access to motor vehicle licensing data, data sharing practices, and platforms. The pilot projects should provide understandable information about changing skill needs at the state level and sub-state regional level.

Ideally, it will be possible to not only understand changes in the demand for skills but also measure and communicate the impact of acquiring a given skill on earnings and successful advancement along career trajectories.[[6]](#footnote-6)

As in Recommendation #3, all processes, linkages, and code should be documented, replicable, and open source.

Products developed through the pilot project or projects should both be based on input from and evaluated by a cross-section of the WLMI system’s major stakeholder groups – e.g., economic development organizations, unions, employers, education/training providers, and workforce boards – based on their most urgent needs and in what form this information should be communicated. The evaluation can be of further value by measuring the impact of WLMI tools through the pilot project to their respective consumer groups.

**5. Issue a call for proposals (possibly through America’s Datahub Consortium – National Secure Data Service) and fund up to four test cases representing different areas of focus such as different data sources or data types. Interested private sector data providers would partner with a volunteer state to link their skills data to UI wage records (and possible State Longitudinal Data Systems (SLDS) data) and provide a report. Recommendations for how the pilots should be structured and elements of a minimally viable product are available in Appendix A.**

**Make all local labor market data accessible**

**6. Ensure that the data already produced by the BLS is made broadly available to the public through a robust, modern API. As new data sources are developed, these should also be made available through the API.**

The BLS currently has a wide range of data available to the public, accessible through its website to those who know the process of navigating the website. However, the ability for data users in the public to build a more user-friendly interface to BLS data is limited by the existing BLS API, which places significant limits on the ability of users to download data. While the entire OEWS data table is available for manual download, accessing the same data through the existing API would require a single user to request the maximum available data possible for 241 straight days to get all the available data.[[7]](#footnote-7) Having a robust API allows outside developers to build streamlined interfaces for data users, unleashing the creativity of non-federal staff, enabling the development of products like those that have been developed to leverage the U.S. Census Bureau’s API.[[8]](#footnote-8)

**Conclusion:** In short, the WIAC recommends the Secretary of Labor support efforts to invest in new types of data sources, produce WLMI resources that are useful at the local level through an open, transparent, and replicable process, and provide enhanced access to new and existing data through modern APIs.

To the maximum extent possible, the results of these efforts must adhere to these principles:

* Transparency – stakeholders and partners must be able to examine in detail the methods by which new data products are developed;
* Open source – in addition to stakeholders and partners understanding the methods used to develop new data products, those data products should be open source to allow replication and expansion of capabilities;
* Accessibility – stakeholders and partners must be able to utilize these new data products;
* Skills-focus – credentials and experience will always have a place in the labor market but it is what those credentials and experience represent in terms of skills that are critical to reducing friction in the labor market and progress along career pathways;
* Geographic granularity – ensure that the data are useful to decision-makers and relevant to local labor markets;
* Responsive – products should be developed with, rather than for, stakeholders and these stakeholders should evaluate their effectiveness;
* Methodological innovation – embrace the use of cutting-edge methodologies, new data sources, agile project management, and human-centered design.

**Appendix A**

**Pilot Process:** The pilots would build towards identifying a minimally viable product (MVP) that could be operationalized as a starting point for developing the WLMI system envisioned by the WIAC. The pilot could be accomplished in the following steps/sets of deliverables:

1. Test the potential of private sector data and other currently isolated administrative datasets being matched against UI wage records. This would involve:
   1. Matching UI wage records to skills records at the individual and employer level;
   2. Developing machine-learning or other statistical models for non-matched records; and
   3. For states that have merged education/workforce records in an SLDS or similar environment, documenting the quality of the imputations with and without education data.
2. Examine the value of supplementing the existing O\*NET with local skills clusters and employer occupational title taxonomies to include benchmarking the results to the O\*NET national results for specific economic sectors.
3. Produce a diagnostic report which benchmarks and documents the results to include:
   1. Testing linkage quality and match rates by different industries, skills, and occupations; and
   2. Documenting and making available the match code to allow select partners to conduct independent evaluations of the work.
4. Work with WLMI users and partner agencies to evaluate the potential to produce timely, local, and actionable evidence produced according to these techniques such as by:
   1. Producing local skill-level information on earnings and employment for AI research-intensive employers if co-funded with the National Science Foundation (NSF).
   2. Producing estimates of local skill demand and supply if co-funded with the U.S. Department of Education.
   3. Producing information about workforce transitions resulting from local demand shocks like the CHIPS and Science Act or Inflation Reduction Act, that can inform timely and actionable policy decisions.

**Minimally Viable Product:** The pilot seeks to test methods of integrating novel datasets with common WLMI datasets such as wage records to produce new WLMI resources, particularly around skills, industries, and occupations and measure the degree to which such an approach can be used to create local area occupation/skills profiles.

An MVP should include the following elements:

1. Linking at least one novel data source with a traditional WLMI data source to provide more robust local, timely, and actionable dataset – examples of novel data sources include: private data sources such as those maintained by LinkedIn, Lightcast, and Revelio Labs as well as the NLx Research Hub maintained by NASWA and other state job listings. Ideally, the MVP would:
   1. Link at least one private data source with UI wage records and at least one public data source to UI wage records, with the possibility to linking all three into a single enhanced data resource;
   2. Include credential/micro-credential extraction and mapping; and
   3. Regardless of source used, the two (or more) efforts would use both supply data in the form of worker resumes or profiles and demand data in the form of job posting data as well as employment projections;
2. A set of measurements and evaluations related to the success of these linkages such as:
   1. Match rates between data sources/elements using different confidence thresholds;
   2. A distribution analysis that helps assess the completeness and validity of the skills mapped to worker/wage data;
   3. A distribution analysis that assesses the completeness and validity of tasks for employers and the skills they demand; and
   4. Precision and recall for the various machine learning models used in the production of the enriched data sources with a comparison of different approaches to identify the most promising models;
3. Comparison of new data sources to other external sources such as the state skills survey and O\*NET; and
4. Evaluation of the new data sources for the value they create for each group of stakeholders such as students/families/workers, employers, educators, economic development organizations, unions, and local and state workforce boards.

Given the size and variance in datasets, an MVP might focus on specific industries, geographies, or groups of occupations – perhaps tied to investments in the CHIPS and Science Act, Bipartisan Infrastructure Law, and Inflation Reduction Act. In terms of geography, the pilots should include an evaluation of the degree to which methods and products developed can be applied at a rural level and the feasibility of such efforts.

1. Meyer, B.D., W.K. Mok, and J.X. Sullivan, Household surveys in crisis. Journal of Economic Perspectives, 2015. 29(4): p. 199-226. [↑](#footnote-ref-1)
2. Cassleman, B., Reliability of U.S. economic data is in jeopardy, study finds. New York Times, July 9, 2024. [↑](#footnote-ref-2)
3. Card, D., Origins of the unemployment rate: the lasting legacy of measurement without theory. American Economic Review, 2011. 101(3): p. 552-557. [↑](#footnote-ref-3)
4. As an example, the State Workforce Services Dashboards developed by ETA (<https://www.dol.gov/agencies/eta/datahub/state-dashboards>) appear to have been built using R. Sharing the source code for these dashboards could help equip individual states to expand upon the analysis ETA has already done, or integrate these dashboards into their other performance metrics at the state or local level. [↑](#footnote-ref-4)
5. For an example, see how the FRED blogs provide instructions on recreating the charts they build, as at <https://fredblog.stlouisfed.org/2024/07/gdp-per-capita-in-the-five-largest-european-economies/> [↑](#footnote-ref-5)
6. For an example, see <https://portal.njcis.intocareers.org/> [↑](#footnote-ref-6)
7. <https://www.bls.gov/developers/api_faqs.htm> documents a 500 query-per-day and 50 series-per-query limit on the version 2.0 API. With 6,020,310 unique series IDs for a single year in the OEWS data alone (<https://download.bls.gov/pub/time.series/oe/oe.series>), this will take 6,020,310 series ÷ 25,000 series per day = 240.81 days. [↑](#footnote-ref-7)
8. See <https://walker-data.com/tidycensus/>, <https://walker-data.com/census-r/> [↑](#footnote-ref-8)