# Annual Report 2023

*Summary of Accomplishments and Priorities*

LEWIS: Several trainings have been conducted and estimates review features have been expanded or improved. Participant evaluations indicate a need to continue offering both in person and live online trainings annually.

WID 3.0: The new structure is complete and published. States have more than a year to implement the new version but support efforts are expected to increase over the next year.

Occupational Licenses: A national top-down review of coding is underway and documentation is being expanded.

Real-time Analytics: NLX Research Hub offerings have expanded and research into their coverage and utility for LMI applications has progressed significantly in 2023. This will be a major area of effort in the coming year.

Training: Focus has been on LEWIS, but staff are facilitating meetings and communication methods for states working to leverage AI and ChatGPT.

Outreach: Committee membership has expanded and we continue to encourage new participation. One new state will be participating in the Spring 2023 ARC meeting and ARC staff have participated in virtual and in-person national LMI events.

Employer Database: DataAxle, the current provider of the data, has offered additional enhancements which we continue to evaluate.

Communication: The LMI Forum, a new, secure communication platform for cross-state collaboration, will be active soon and be used for support of LEWIS and WID 3.0 implementation. The ARC website will get some maintenance as many references to WID 2.8 in the documentation will need to be updated and Google Analytics had updates in 2023 that will require more in-depth configuration.

# Contents

The Analyst Resource Center (ARC) is a cooperative group of states that comes out of the Workforce Investment Grant (WIG) funding activities ranging from implementation of the Workforce Information Database (WID), state and regional projections, occupational licenses, to research and publications work. ARC has twice-annual in-person meetings and topics of interest have virtual meetups in between. The grant is supported by staff in Minnesota and Utah who are tasked not just with organizing the meetings but with research into emerging topics, supporting specific software and other resources, managing occupational license data submissions, and finding and connecting resources that support the goals of the ARC.

## ARC Meetings

A major current and historic role of the ARC grant is to bring together people from state Labor Market Information offices to talk about the challenges facing their work and brainstorm ideas about how to address them. This serves several purposes – it gives an opportunity for collaboration between people who do similar supporting data work in state offices, it allows upcoming concerns to be elevated to Department of Labor leadership to increase visibility, and it brings tasks that can be done centrally for the benefit of all states to the attention of paid ARC support staff to help direct the priorities of how our time is spent.

In 2023 ARC returned to its pre-pandemic schedule of meetings with Spring and Fall in-person events. There have been many new faces even with returning states because of retirement and staff turnover. New states have attended multiple meetings – Washington State, New Jersey, South Carolina, Texas, and Colorado. It's critical that those meetings continue to attract people who have the energy and interest to facilitate opportunities for collaboration and bring important work to the forefront. Attracting those participants requires outreach at other events and strong interpersonal skills necessary for recruitment. All of the recent additions to the group have been sought out and encouraged to attend by ARC Director, Bill McMahon. They're often found when giving presentations at national conferences or online forums and are personally invited, requiring a virtual meeting first to explain the purpose of ARC and to discuss their interests.

The priorities that have come out of recent meetings include the following.

### Training

In 2023 there were two dedicated LEWIS trainings held, a large online one over the summer with nearly 100 participants and a smaller in-person advanced training in the fall. Additionally, LEWIS staff attended OEWS and Projections national conferences and presented on the software, totaling five 90-minute sessions at those events. Arranging a LEWIS training is a collaborative effort between several ARC staff members and host states for in-person events to cover publication, registration, confirmation of BLS agent status, identifying appropriate trainers, and conducting the event itself.

### Python Users Group

The Python Users Group had some successful meetings through the first half of the year, but then it got overrun by AI enthusiasts and their spinoff took most of our people. Additionally, NASWA debuted their R User's Group in the summer, which is a much more common program in state Labor Market Information offices and also pulled people away from the Python User Group.

## WID 3.0

The Analyst Resource Center (ARC) has developed a WID 3.0. A departure from the 2.X versions means larger changes to the database structure, especially to the primary key structure. In regular updates, there are fields added to tables, removed from tables, field type expansions (longer text fields, larger numeric types), table deprecations and additions. The core lookup tables are kept the same and field names are unrevised to minimize impact on dependent applications and automation. By contrast, a major version release will change primary key structures, which will affect both lookup tables and data tables. Some core tables may be dropped, and others designated as core. All tables deprecated in the 2.x versions will be deleted.

Having states use the WID as a common structure offers many benefits. It:

- Gives states that experience unexpected turnover a central resource that can help them make sense of priorities
- Allows improved communications between states
- Allows partner organizations that provide outputs to have a single point of contact for requirements rather than 50 different stakeholders
- Saves state resources from doing design work. Designing a database structure so that it can adapt to changes, include all appropriate details, and documenting that design so that others can use it is challenging and doesn't need to be duplicated in each state

In the past year, a final version of the structure has been released and publicized.

## AI/ChatGPT

Many participants have experimented with the emerging technology both for personal productivity and for specific use cases. These efforts are complicated by ambiguous state policies on the use of third-party software. States are develop very different policies around AI; Washington state is a hard no but investigating enterprise licenses; North Carolina was initially accepting of AI but rolled it back and now don't allow use of ChatGPT; and Minnesota has a minimalistic policy that specifies that staff not use AI with private data but otherwise leaves it to manager discretion.

### Use Cases

Looking forward, we've developed a template for reporting out on established use cases, including questions of security and reproducibility. While more participants are exploring the technology, so far there aren't discrete tasks that could be showcased.

### ChatBots

Since the latest ChatGPT update in November 2023 (immediately preceding our meeting), a lot more focus has been on developing a chatbot that is constrained to consuming only vetted Labor Market Information. One of the challenges of the free tools is that it's difficult to find the source they're drawing on and output may be outdated. For Labor Market Information offices, working with official releases and publication schedules and data revisions, that's not an acceptable way to present official numbers. Newer tools allow configuration that will answer particular questions from specific sources or prevent the bot from looking outside a defined website for answers to more ambiguous questions. This has the potential to make chatbots useful, particular for workforce development with its customer focus. North Carolina, Wisconsin, and CareerOneStop have all

taken significant steps towards functional chatbots and actively participate in the ARC communication channel keeping others updated of their progress.

### API integration

One significant challenge of AI is ensuring that it gives correct information. It can always give a plausible, coherent response, but consistency and validation is not as reliable. If asked about the unemployment rate in an area, chatbots will sometimes respond with data that's far out of date or that has been revised or is estimated by a non-BLS source. An alternative to developing a specific chatbot for a given site is to offer up a vetted source for labor market information that is structured to be easily consumed by other organizations' chatbots. This possibility is being explored by participants in Oregon.

## Deliverables

ARC staff act as facilitators for the meetings themselves by arranging them, coordinating reimbursements to states, defining the agenda, attracting participants, and conducting the follow-up needed to keep the participants connected. That work peaks in the time leading up to meetings, but includes at least one remote meeting targeted at regular ARC participants per month. In between meetings, staff time funded by the ARC grant focuses on other required deliverables.

### LEWIS

The LEWIS application was originally desktop software developed in North Carolina as a means to aggregate Occupational Employment and Wage Statistics (OEWS) survey data to state specific regions while still following the very specific estimation and suppression procedures used by the BLS. Because OEWS data is only published for states, MSAs and Balance of State regions, many states saw the value in being able to produce reliable estimates for regional definitions that they use in their states. Some states use it for research purposes to produce estimates about minimum wage jobs or combined clusters of occupations thanks to the very granular wage and occupation filters it allows. It also provides a critical output file for state projections methods, a deliverable of the WIGS grant. The funding was established through the ARC because at the time the ARC was administered through North Carolina and because of the program's utility for helping states with their Projections deliverable.

The management of the software was eventually moved to Utah where there is a team of developers to maintain this and related software including ProjectionsSuite to ensure continuity and upgrades to new technology as its original creator approached retirement. The transition process was complex and extra short-term funding was provided to improve that process. In 2019/2020 ARC received approval to begin a new cloud-based version of the application. The original desktop application had many problems; installation in different state IT environments and supporting those differences was cumbersome, and there were security concerns as microdata was stored on a local computer or passwords were shared. The web-based application has been eagerly anticipated for its easier management.

The new version also has many more security features than previous versions. The use of the web-based system was relatively uncommon when the project began and features and requirements were developed with extensive BLS oversight, ensuring that all applicable federal standards were met. Additionally, all users are reviewed to ensure they have BLS agent status and there are tiers of access that allow states to manage their

own users. Projections staff can be given access only to their needed outputs while OEWS staff retain ownership of the estimates themselves, all features that were left to states in the desktop software.

In December 2021 OEWS made significant changes to their methodology, implementing the MB3 method for the data published in March of 2022, which allows for publication of much smaller cells but is much more intensive in terms of processing. The December 2021 release was done on time to allow the States to review their preliminary data, and some states assisted in testing prior to that release. The review tools OEWS provided to states are no longer usable so LEWIS is now being used by all states for estimates review, which is a state deliverable of the OEWS program.

In 2023 a lot of work was done to improve the performance of the system, and there were some new tools added to assist users in validating screening rules. Four trainings were conducted in 2023 (described above), one each in 2022 and early 2024, and more are planned.

The cost of cloud computing is very much dependent on resource use. The greater amount of back-end processing required by MB3 has increased that resource use, as has the increased adoption of the software as states are training their staff for estimates review in addition to projections, publication, and research uses. Even though the development costs have stabilized now that we're in a maintenance phase, the costs of operating the software remain.

## Organizational Outreach

The ARC is effective because it connects people. Having a strong network of organizations and people we have worked with serves many purposes. It allows us to publicize our work and resources and those of CareerOneStop more broadly to states who could benefit from them. It allows us to recruit new participants in ARC meetings and new collaborators on research and other projects. It allows us to improve visibility and garner support for larger, necessary endeavors. All paid staff participate in this – developer staff focus their outreach on the PMP Summit and OEWS national conferences, leadership staff presents updates to LMI organizations such as the WIAC and WLMI Committee as requested, and all staff attend and present meetings where their work overlaps with the priorities of the event. In recent years, NASWA has been a significant partner. Staff provide support to state users of software and resources, external researchers, and participate in research collaborations. A summary of outreach efforts follows. External meetings occurred on average 5 times per month in 2023, with additional engagement occurring through email.

### *Organizations:*

Employer Database (vendor DataAxle)
CredentialEngine – Monthly License Governance Meetup
User Groups – R, Python, AI
OEWS Policy Council – LEWIS Workgroup
NASWA/NLX – Data Governance monthly meeting
Workforce Information Advisory Council (WIAC)
Workforce and Labor Market Information (WLMI) Committee
Bureau of Labor Statistics (BLS)
Employment and Training Administration (ETA) – monthly check in
Projections Management Partnership (PMP)
DirectEmployers – Jobs API, Certifications in Demand method
CareerOneStop Advisory Group

*Events*

NASWA meeting (annual, some or all of us present)
ARC meetings (twice annually)
Code for America (annual)
OEWS National Conference (LEWIS staff)
PMP Summit (LEWIS staff)
LEWIS Trainings (annual in-person and annual online)

*Projects*

NLX Research Hub Pilot and presentations to Convening
LEWIS/BLS partnership (meeting occurred, potential project)
WID Output Formats – LAUS/CES/QCEW BLS teams
AI – Remote meetings and facilitating communication for ARC states including OR, NC, WI, MT, VA

*Support*

Washington State – Employer Database, WID structure, ARC membership, License methods
Kentucky – Jobs API
North Carolina – Projections load, license method
South Carolina – Onboarding
Ohio – Text generation methods
Licensing Admin system – WA, DOL

*Research*

Virginia Tech Licensed Occupation research – support for using and understanding the data
NLX Coverage – independent research and collaboration with NASWA and BLS JOLTS
Loyola Future of Work research – attended presentation

## License data

The Analyst Resource Center (ARC) has been collecting the WIGS grant deliverable of occupational licenses from states since 1997. These are submitted by states and compiled by ARC staff and published on the CareerOneStop site for greater national visibility to jobseekers. Occupational Licensure is a critical element in the workforce. Like certifications, licenses are a non-degree credential that demonstrates competence to employers and customers. They're required by states to protect the public good and ensure consumers receive reliable services, but that creates a barrier to entry for people entering those occupations. Because they're state-specific, it's not always clear how easily licensure in one state can be transferred to another or if it's even required. For a jobseeker, a national reference for occupational licenses is needed for career advancement and relocation. Recently this has become a focus for active-duty military, as their spouses can be relocated across state lines and need to know licensure requirements. It also serves researchers who often look at licensure as an indicator of labor market conditions. The Occupational License data collected by the ARC is the only nationally comprehensive source of that information. There are some independent efforts that focus narrowly on a subset of occupations but leave out many licenses. For the breadth of coverage, there is no alternative but the data compiled by the ARC.

This is a significant task dependent on the labor of our staff in Minnesota. In recent years, most submissions occur at the June 30 deadline, so there tend to be two major periods of work. In July/August, all new submissions are incorporated to the primary database and reviewed. In February/March any late submissions are processed (a much smaller number) and more in-depth review occurs, as well as central collection and updating. This includes federal licenses, license compacts, and top-level review of coding in case errors have crept in.

Communication about the deliverable happens throughout the year. Sometimes states will want assistance improving their process, researchers have questions about the data source, and documentation can often be improved. Other projects with dependencies sometimes come up.

For 2023, documentation was expanded and some outreach for research uses and streamlining submission occurred.

In 2024, expected changes include continued documentation work, a new file submission method, and collaboration with CareerOneStop in identifying license-requiring occupations in the job feed available on their site.

The following summarizes the most recent submission we got from each state but does not include six states that have submitted recently.

| Data Release | States Included |
|---|---|
| *2023* | Arizona, Arkansas, California, Colorado, District of Columbia, Illinois, Louisiana, Iowa, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, Wyoming |
| *2022* | South Carolina, Ohio, Kansas, Kentucky, Delaware, Maine, Maryland, Georgia, Hawaii |
| *2021* | Indiana, Alabama, Connecticut, Minnesota, Wisconsin, Vermont |
| *Earlier* | New Hampshire, New Jersey, Guam, Florida, Michigan, Puerto Rico, Alaska, Idaho, Massachusetts, Nevada, Virgin Islands, Northern Mariana Islands, American Samoa, West Virginia |

## National Labor Exchange

The National Labor Exchange (NLX) is essentially an online job board put out by DirectEmployers, a nonprofit Member-owned and -managed association. DirectEmployers provides employment services to a wide array of companies and as part of their service they publish job advertisements that combine the ones they get from employers with those from all state job banks. That data, both current and historical, is then made available for research uses through the NLXResearchHub, which is managed by NASWA. The data is available to state users at no cost, but because of its size and because it's not survey data it can be challenging to use and interpret. However, the data is attracting interest for a variety of uses.

For researchers looking to identify particular skills and their demand in the workforce, the NLX offers a valuable supply-side data source found nowhere else. The full-text descriptions allow the selection of skills on nearly any criteria imaginable. CareerOneStop's success in using those descriptions to identify certifications in demand through the years has offered a template for others looking for other types of content in the descriptions.

Additionally, interest in using openings for current demand has expanded. Initially this was driven by private companies like Indeed issuing their own estimates of demand based on use of their platforms, then companies like BurningGlass heavily marketed their products based on scraped job postings data to states, then BLS recently expanded its JOLTS program to include estimates for states where it had previously been limited to national data. The interest in this topic is only increasing, but available options all have limitations that could be addressed by using the NLX Research Hub data, which is granular enough to give detail and transparent enough to identify anomalies, and national in scale. Its inclusion of Job Bank data leads it to have much more variety of industry and employer size than other services.

For many years ARC and CareerOneStop have made use of job postings data from the National Labor Exchange through DirectEmployers. In recent years NASWA has improved their NLX Research Hub resources and recent focus has been on using that familiar data with the Research Hub as a source so that any applications can be made useful for other states.

While the potential of the data to enhance or expand established and more reliable Labor Market Information has been recognized for quite some time, the recent enhancements to the data source has made that use case more realistic and ARC's Minnesota staff (Bill McMahon and Amanda Rohrer) have the long-term expertise needed to evaluate the potential for those use cases. From his role in CareerOneStop as a consumer of the data long before the Research Hub, Bill McMahon has established relationships with all parties involved. He's worked with Direct Employers to address problems in publication and data quality through many years and maintains a consistent monthly meeting with the Research Hub staff to ensure both that CareerOneStop's products and users are consistent with established data governance policies and to communicate about research uses.

Amanda Rohrer uses the data for research, using the Research Hub offerings to evaluate and communicate their utility to states through the ARC. That includes documenting the technical challenges of connecting to APIs and managing the sheer size of the data so that it can be better communicated to states just getting started, and in evaluating the quality of the contents alongside other Labor Market data. Current projects include evaluating the data's coverage relative QCEW to see if it's possible to assign industries or weight the data to better reflect the characteristics of the known universe of employers, evaluating the time series as a whole, comparing state coverage, and mining the descriptions for terms related to green jobs. This research work can be time-consuming, but helps other states and the national use cases. The findings are presented formally at NASWA gatherings, both online and in-person and written documentation is provided to Department of Labor about data quality.

## WID Structure

Historically the WID structure was defined by the ARC and just supported and publicized by staff. In 2020, midway through WID 3.0 development, the lead of the Structure Subcommittee resigned and Amanda Rohrer stepped in to get the already announced version to completion. The process has been time-consuming but now the final version has been released. The website will need to be updated to reflect new table names in the more general documentation and there's likely to be another burst of labor when states implement it in 2025.

## IT Environment and Resources

The ARC maintains its own website and with that a file server for distributing files to states. Because of the potential of the grant to move between states and state policies (state branding for websites, size limits on file downloads) the decision was made in about 2015 to use Amazon Web Services (AWS) to host the website and

file server. This has the added advantage of being able to use other AWS tools to help states with pilot projects related to the ARC – in the past we've built a working version of our API specification and a version of the WID structure that's accessible externally as a database. While the website is fairly simple, keeping it stable and secure requires some web expertise. Utah staff are responsible for doing basic maintenance.

Recently the file server was overhauled and replaced with an AWS method of file sharing. This solves occasional problems with the security certificate and stability and is likely to be more cost effective in the long run.

A new communication platform the LMI Forum will be debuted by staff in Utah soon. This makes use of the existing user base for Projections and LEWIS software to validate individual credentials and will be able to facilitate everything from water-cooler level chat to dedicated Community of Practice style groups and pretty much anything that users can think of. It has been built from the ground-up in an ARC/PMP collaboration to provide a secure and user-customizable experience specifically designed for the State LMI workforce. While part of the vision is to allow LEWIS and Projections users a space to connect with one another, it will also include topics tied to the ARC – WID, AI, Occupational Licenses, potentially others – and gives states another avenue for getting support for technical challenges.

In the coming year, in partnership with Utah, we intend to come up with a simple file submission option to replace the one currently on the website for occupational licenses. The current version has a small file size limit, clunky interface, and no means of alerting staff to new files or tracking who provided them. AWS has options that would do better tracking and alerts and look more professional.

Website analytics are also useful for tracking outside engagement with our online resources. Google analytics is used for that tracking, but in the last year there was a major update to the platform and new dashboards will need to be created in the coming year. That will likely fall to Minnesota staff.

## Employer Database

ARC staff are still responsible for supporting LMI offices in their use of the Employer Database – a list of employers from a private vendor that allow users to find company names (something prohibited by CIPSEA rules for our own products) for all states and CareerOneStop. ARC staff also evaluate vendor updates and respond to concerns.

## Contact list updates

The technical contact list that the data validators began in 2020 has been running consistently since then, with regular updates to contacts. This list is used both for our own communications about LEWIS and WID updates and by Department of Labor for their communications purposes.