Virginia AI Landscape Assessment

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VA CHAMBER FOUNDATION

ECONOMIC LEADERSHIP

Virginia AI Landscape Assessment
Executive Summary

Economic Leadership, LLC was engaged by the Virginia Chamber Foundation with financial and project related support from GO Virginia to conduct an artificial intelligence (AI) landscape assessment across the Commonwealth. Through surveys, focus groups and interviews in all nine GO Virginia regions, a review of current literature, and data forecasting, this study endeavors to understand the current climate for AI in the Commonwealth and predict potential workplace and workforce impacts.

Using the data and information collected, a series of actionable recommendations has been developed to put the Commonwealth in the best position to mitigate AI impacts and to capitalize on AI-related opportunities over the next few years and to provide a foundation for more detailed workforce assessments at the regional level that will be needed to prepare Virginia workers for the AI impacts that are expected.

Understanding AI and Potential Impacts

Use of Generative AI (GenAI) tools and software is growing faster than any new technology ever introduced. ChatGPT alone reports 800 million users each week and over 2.5 billion queries per day. Recently, Walmart's CEO was quoted in the Wall Street Journal as saying, "Maybe there's a job in the world that AI won't change, but I haven't thought of it."

It is widely expected that the deployment of AI tools and agents will change many jobs as they exist today, make some jobs obsolete, and create new types of jobs. But the extent to which AI will affect specific occupations and individual positions varies widely based on the type of tasks associated with the job.

Researchers and organizations such as McKinsey & Company, Indeed.com's Hiring Lab, Goldman Sachs and the World Economic Forum have all published studies within the last two years indicating somewhere between 20-30 percent of U.S. occupations could be subject to automation within next 5 years.

Thus far, most studies are not reporting widespread displacement of workers due to AI. While we have yet to see major changes in hiring or industry disruptions due to AI in Virginia, the general consensus is that AI tools have begun to change hiring practices and job requirements for certain occupations and AI will significantly impact certain industries much more than others within the next two to five years.

AI Use and Perspectives in Virginia

Virginians are using AI at rates greater than most other states. ChatGPT's parent company, OpenAI reported in July 2025 that Virginia had the highest quarter-over-quarter growth in use of ChatGPT

among all states. AI use by Virginia businesses has more than doubled since the U.S. Census Bureau began surveying businesses bi-weekly in September 2023.

As part of the Landscape Assessment, AI-related feedback was collected from 520 attendees at the Virginia Chamber of Commerce's Blueprint Tour stops held throughout the nine GO Virginia regions:

- A very high percentage (83.7 percent) of Blueprint Tour attendees represented organizations that have begun deploying AI or that are considering deploying AI
- Less than one-fifth of respondents indicated that their firm had adjusted hiring practices due to AI and another one-fifth were unsure
- Highlighting an area of focus for additional resources, only 27 percent of respondents indicated that AI training resources were readily available in their region

Additionally, an online survey and 38 employer interviews were conducted to obtain further information about AI use and adoption across the Commonwealth. Eight themes that emerged from the survey and interviews include:

- The opportunities and impacts related to AI in Virginia are just beginning to come into focus
- Workers need to be "AI literate" and need clarity (and encouragement) on AI use in the workplace
- Generative AI (GenAI) is "next level AI" and requires a different set of workforce skill sets than previous AI
- A high likelihood that jobs will change, some jobs will disappear, and new jobs will be created
- The training resources are not fully in place today and the ones that are will be challenged to respond to the volume of demand and pace of technological change
- AI offers huge benefits for businesses, but AI deployment needs to be strategic and integrated to be most successful
- Virginia has a unique opportunity to benefit from AI that many other states do not (if the infrastructure is there to support)
- Finding the right tone of policy and regulatory engagement for AI will be an important determinant of how effectively it is utilized

Virginia AI Asset Mapping

In July 2025, there were 8,940 unique job postings in Virginia that mentioned AI in the job description and since 2022, about 6,350 different employers have competed in the state for AI talent. The jobs posting data also shows that Region 7 (Northern Virginia) has the highest concentration of employers looking for AI talent.

To encourage the use of AI in education for teaching and learning, in January 2024, Governor Youngkin issued Executive Order 30 on Artificial Intelligence, which put forward the official *Guidelines for AI Integration Throughout Education in the Commonwealth of Virginia*. Key principles from this order

include: a requirement to ensure AI integration is done ethically and safely and a focus on harnessing AI to empower students, enabling more personalized and adaptive learning experiences.

Providing AI literacy for incumbent workers at the scale and volume required will involve both traditional workforce training partners and new training resources and partners. As demonstrated in surveys and interviews, many employers reported that sufficient training capacity is not available and/or it is not apparent how to access training resources in their region.

In addition to large industries and employers, Virginia's economy is also driven by the more than 850,000 businesses with fewer than 250 employees located throughout the Commonwealth. Targeting training resources to help small and mid-sized businesses will need to be a key priority to ensure they are able to capitalize on AI productivity and new product development opportunities the same way large firms are beginning to benefit.

Efforts to train students in the field of AI are somewhat limited in Virginia right now. At this time there are few AI-related degree or certificate programs offered at Virginia community colleges and the number of AI degree programs at Virginia's four-year colleges and universities is very limited with only Hampton University and Marymount University offering bachelor's degrees in Artificial Intelligence and George Mason offering a Master of Science in Artificial Intelligence Degree.

Despite the limited number of AI degree programs, the ability of Virginia colleges and universities to train tech talent has been a key factor in Commonwealth becoming a hub for technology businesses. The number of certificates and degrees offered and the volume of graduates in programs such as Data Science, Computer Science, Computer Engineering, Computer and Information Science and other related fields will help support the technology workforce needs of AI firms in Virginia.

Virginia's data centers, fiber connectivity, concentration of internet and digital firms and its tech-trained workforce are factors that should help grow and attract AI-related firms. To be successful as a hub for AI businesses, infrastructure such as available and affordable power, building sites, targeted business incentives and robust technology workforce training programs are essential.

Forecasting AI Impacts in the Commonwealth

Section 4 of the Virginia AI Landscape Assessment report includes forecasts of potential impacts of AI on jobs and industries in Virginia. Region-specific forecasts are also included in Appendix B of the report. Some of the key findings include:

- Several studies indicate that Virginia is projected to be among the top 5-10 states in the number of jobs "exposed" or "highly exposed" to impacts of AI
- As many as 1.5 million jobs (about 35 percent of all jobs) in Virginia could be impacted in some way by AI-related changes
- The jobs of nearly 500,000 young workers (ages 21-35) across the Commonwealth are likely to be exposed to AI-related impacts and changes

- AI's impact is most likely to be felt in larger and more densely populated metro areas as well as in areas with higher educational attainment levels
- Forecasted AI related impacts range from 29 percent of jobs in GO Virginia's Region 3 to 39 percent of jobs in GO Virginia's Region 7
- Among the top occupations in Virginia expected to be exposed to AI impacts are software developers, general and operations managers, customer service representatives, and clerical workers
- From an industry perspective, almost 58 percent of jobs in finance and insurance are projected to be exposed to AI impacts
- Other industries including professional services, information, and management all have an exposure share of over half of their workforce.

Summary of Recommendations

Information gathered as part of the landscape assessment process and analysis conducted on potential and likely impacts yielded the following five key workforce and workplace objectives to ensure Virginia workers and businesses are competitive in the AI era:

- Future workers need AI familiarity and data literacy
- Incumbent workers need AI training, policy and use clarity and reskilling as their jobs change
- Displaced workers need re-employment training and assistance
- To maximize the benefits of AI, businesses need to strategically deploy AI and provide training and clarity for workers on AI use
- Virginia can be a leading state for AI-related business attraction and expansion if the infrastructure (utility capacity, sites, fiber connectivity) can keep up

The 34 recommendations outlined in Section 5 of this report are organized around the five goal areas:

1. **Pursue universal AI Literacy across the Commonwealth of Virginia -** *Pursue universal AI literacy across the Commonwealth by deploying AI literacy training resources that every student and every working-age Virginian can easily access*.
2. **Provide Workplace Training and Resources for Incumbent Workers** – *Immediately develop and implement new workforce training resources and improve visibility and access to existing training resources to strengthen incumbent workers' workplace skills that are essential in an AI-enabled workplace – training and resources are needed for incumbent workers at all levels within organizations and existing training organizations won't be able to fully meet the unprecedented volume and pace of demand.*
3. **Training and Resources for Workers Impacted by AI Deployment -** *Provide reskilling and upskilling resources for any displaced workers and develop re-employment resources specifically for workers impacted by AI.*
4. **Assistance for Virginia businesses and organizations to optimize the impact of AI** - *Help Virginia businesses and organizations by providing tools, technical assistance and resources so that they can optimize the impact of AI.*

5. **<u>Ensure the infrastructure is in place to support the growth and attraction of AI-related businesses in Virginia</u>** – *Virginia is better positioned than most states to attract and grow AI-related firms if sufficient electric capacity, sites and locations, and capital is available into the future.*

Significant disruptions and changes are likely for workers and businesses in every region of Virginia as AI use and adoption increases over the next few years. Fortunately, Virginia's proactive efforts over the past two years to focus on AI literacy and on creating conditions for existing businesses to take advantage of AI tools puts the Commonwealth in a strong position to mitigate AI impacts and capitalize on opportunities during this time of transition.

Much of the significant work required over the next five years to equip Virginia's workers and businesses the with training, tools and resources to adjust to AI-related workforce and workplace changes and to capitalize on AI-related opportunities is just getting started and will be essential during this period of technological change. It will require the focus and coordination of existing organizations and structures and the deployment of new tools and resources as well.

Through successful implementation of strategies to prepare Virginia's businesses and workforce, Virginia should be in one of the strongest positions among all states to capitalize on AI-related opportunities and mitigate disruptions and impacts associated with the advancement and deployment of transformative AI technologies.

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Introduction

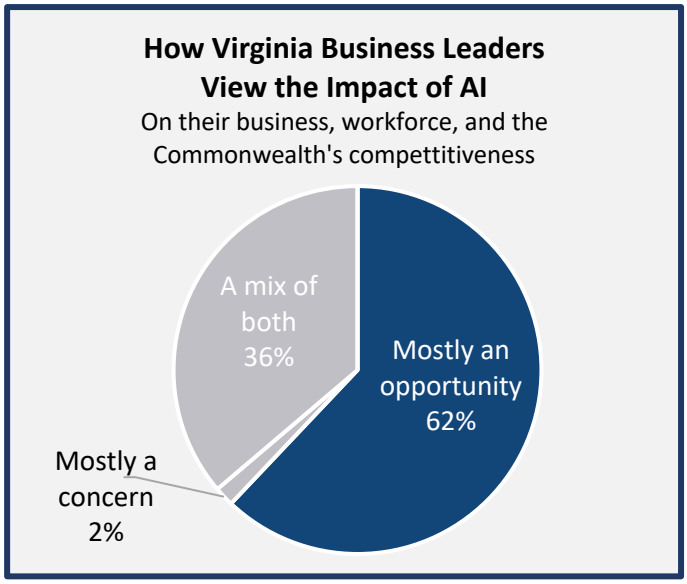
Since the November 2022 launch of the first Generative AI tool – ChatGPT – it seems as if every business and news publication has a daily article about the predicted impact and disruptions Artificial Intelligence (AI) will have on specific types of jobs, industries and even entire economies. *Forbes* wrote about the impact of AI on specific occupations under the headline "These Jobs Will Fall First as AI Takes Over the Workplace" while *The Dispatch* asked, "What if AI Means More Jobs, Not Fewer?" One recent *Axios* headline referred to AI as an impending "White-collar Bloodbath" at almost the same time the *New York Times Magazine* ran a piece entitled "AI Might Take Your Job. Here Are 22 Jobs It Could Give You."

As with any new disruptive technology or innovation, humans are feeling a range of perspectives about AI. Workers are beginning to utilize some Generative AI tools in their workplace but, in many cases, they are reluctant to admit using AI or fearful of the technology eventually making their job obsolete. Business executives see huge potential for creating process efficiencies and achieving savings but many small- and mid-sized firms do not have an AI strategy or specific leadership expertise to fully capitalize on the opportunities. Policymakers have begun drafting bills and regulations related to AI but there is little consensus on how the massive amounts of data should be used and protected, when humans need to be involved in decision-making, ethics and disclosures necessary and how best to protect intellectual property.

Since ChatGPT was released, many have predicted that large language models - in particular, generative AI (GenAI) - will completely transform workplaces and change or eliminate many jobs. While these predictions are often quite dramatic and AI use is certainly increasing, thus far the reported workplace and workforce impacts have been fairly minimal. Nevertheless, there is clear consensus that the rapid development of AI and deployment of Generative AI tools and agents will create impacts throughout the economy and across the Commonwealth of Virginia within the next two to five years.

While many of the impacts should eventually lead to greater productivity and accelerated product development at firms large and small across the state, there will also be a period of disruptions and changes to specific occupations, businesses and industries as part of the transformation. States that are preparing their workforce and firms to benefit from AI and that are proactively working to mitigate impacts to jobs and industries caused by AI deployment will be best positioned to benefit from this rapidly growing technology.

Within the next 2 to 5 years, thousands of Virginia businesses and workers will experience impacts resulting from the deployment of artificial intelligence (AI) tools and agents. Because of the composition of occupations and industries in Virginia, several research studies indicate that Virginia is among the top 5-10 states in share of positions that will be impacted by the deployment of AI. Despite the widespread change that has been predicted, employers surveyed for this project mostly view AI as a competitive opportunity for their business and for the Commonwealth.



Workforce training organizations and resources are needed to help workers respond to changing opportunities, business-focused organizations have a role to play in helping firms adapt to emerging technologies, and government and community organizations are going to be essential for minimizing the disruptions and creating new opportunities for workers and businesses. By continuing to prepare its workforce and employers to be competitive in the AI era, Virginia should be in a strong position to mitigate adverse impacts and take advantage of new opportunities, resulting from this emerging technology.

Economic Leadership LLC (EL) was engaged by the Virginia Chamber Foundation with financial and project related support from GO Virginia to conduct a landscape assessment of AI across the Commonwealth. Through surveys, focus groups and interviews in all nine GO Virginia regions, a review of current literature, and data forecasting, this study endeavors to understand the current climate for AI in the Commonwealth and predict potential workplace and workforce impacts. Using the data and information collected, a series of actionable recommendations has been developed to put the Commonwealth in the best position to mitigate AI impacts and to capitalize on AI-related opportunities over the next few years and the report provides a foundation for more detailed workforce assessments at the regional level that will be needed to prepare Virginia workers for the AI impacts that are expected.

Section 1 – Understanding AI and Potential Impacts

There is a large and rapidly growing volume of information being published about AI and its possible impacts on jobs, businesses and the economy. Because much of the analysis has been developed since the first GenAI tools were deployed in late 2022 and because AI tools are rapidly advancing, much of the analysis and projections are nascent. Nevertheless, to analyze, forecast and prepare for the impacts of AI on Virginia jobs and workplaces, understanding the latest thinking and analysis related to AI is essential.

What exactly is AI?

The term "Artificial Intelligence" was first used in 1956 by a Stanford computer scientist who convened a conference on Artificial Intelligence at Dartmouth. In the 50's and 60's, Stanford researchers were beginning to think about computers that could think like humans and around that time IBM created a self-learning program that could play checkers.

While there is no one universally agreed-upon definition of AI, this one from Google nicely describes AI in general as a "field of science":

> "Artificial intelligence is a field of science concerned with building computers and machines that can reason, learn, and act in such a way that would normally require human intelligence or that involves data whose scale exceeds what humans can analyze."

Although AI has been around in different forms for nearly 70 years, once Generative AI tools (such as ChatGPT that quickly generate new text, audio, and images) became widely available in late-2022, both the opportunities and concerns related to AI have become much more tangible and front-of-mind for workers and businesses throughout the Commonwealth of Virginia.

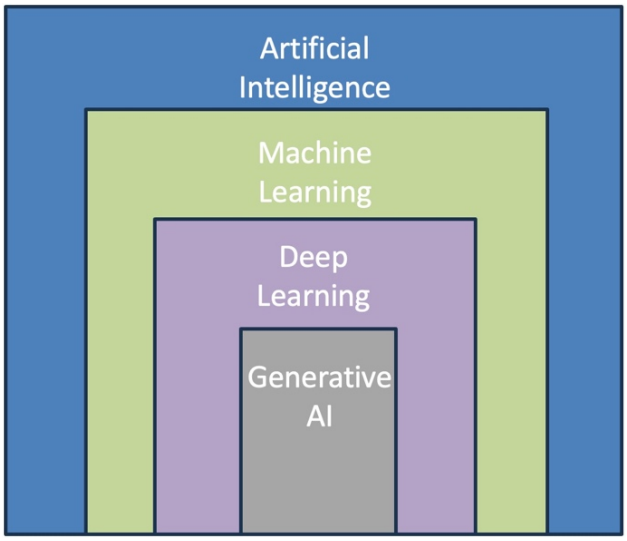
Use of GenAI tools and software is growing faster than any new technology ever introduced. ChatGPT alone reports 800 million users each week and over 2.5 billion queries per day.

AI use by Virginia businesses has more than doubled since the U.S. Census Bureau began surveying businesses bi-weekly in September 2023. 9.9 percent of Virginia businesses reported using AI in the mid-July 2025 survey which exceeds the 9.3 percent rate of AI use among businesses nationwide. When asked whether businesses anticipate using AI during the upcoming 6 months, Virginia businesses again exceed the U.S. average with 13.1 percent of businesses planning to use AI compared to 12.3 percent nationwide. In targeted surveys and interviews of employers conducted as a part of this landscape analysis project, a much higher rate of AI use among participants was reported (further details are reported in Section 2).

Using Google's definition of AI as a "field of science" then it is the field that encompasses the development of machines that can replicate human behavior. But having a field of science isn't very

helpful to humans and to businesses unless applications and tools are developed to apply the science for real-world use.

Machine Learning is a subset of Artificial Intelligence through which computers analyze and learn from incredibly large sets of data and inputs using algorithms. The algorithms are the framework for detecting patterns and making predictions and recommendations by processing data rather than receiving specific programming instructions. In machine learning, the algorithms are trained to detect patterns and make predictions based on the review of the data. And when we say large amounts of data, this means all the data on the internet and beyond. The real benefit here is machines can review data at a rate so far greater than humans ever could.



Deep learning is another subset of machine learning (that is within the field of science and engineering that is known as AI) that instead of using algorithms, it uses neural networks that are designed to mimic how neurons interact in the human brain to receive and process data through multiple layers to recognize increasingly complex features of the data. Through iteration and feedback, deep learning algorithms can correct and improve its' prediction abilities.

Finally, **Generative AI** is an application of AI that uses deep learning to *generate* new content based on the review of vast amounts of data. These are sometimes referred to as Large Language Models (or LLM's) because of how much information and data they ingest – predominately from the internet.

GenAI programs and applications interact with users using conversational language and that can generate new content based on an analysis of massive amounts of data. Examples of GenAI tools include OpenAI's ChatGPT, Google's Gemini and Anthropic's Claude which are "chatbots" that interact with users through text-based inputs and queries and primarily generate text-based responses. Other GenAI tools include Google's NotebookLM that can generate text or audio outputs. Dall-E (also from OpenAI) is an example of the GenAI tools that can generate images. Many other tools and applications have been released for specific tasks and activities (GitHub to assist with coding, for example).

Research on AI and Occupations

Today, almost every news publication and business blog has a headline-generating take on what AI means for the future of jobs or how AI is likely to disrupt entire industries. Recently, Walmart's CEO was quoted in the Wall Street Journal as saying, "*Maybe there's a job in the world that AI won't change*, but I haven't thought of it." Researchers and organizations such as McKinsey & Company, Indeed.com's Hiring Lab, Goldman Sachs and the World Economic Forum have all published studies within the last two years indicating somewhere between 20-30 percent of U.S. occupations could be subject to automation within next 5 years.

Research on AI and Occupations

- Estimates vary, but somewhere between 20-30 percent of occupations could be subject to automation within 5 years.
- Depending on the mix of skills, some jobs will be fully automated, many augmented and others minimally impacted
- Highly educated, higher wage, white-collar and creative occupations are most "exposed" to GenAI
- STEM fields are more likely to be exposed to AI but with advent of AI, demand for AI-specific skills is spreading to a broader set of occupations than just tech
- In addition to AI literacy, employers are seeking skills such as creative thinking, resilience, critical thinking, systems thinking and agility

Thus far, most studies are not reporting widespread displacement of workers due to AI. A 2025 publication by the Yale Budget Lab found no discernable link between occupation levels and AI. The Yale Budget Lab study and others are noting changes in the types of positions that firms are posting, and other researchers are identifying some softening of hiring, especially for younger workers, in occupations impacted by AI. Researchers at Stanford University found that early-career workers (ages 22-25) in the "most AI-exposed occupations have experienced a 13 percent relative decline" even after other economic impacts were controlled for. The same study found that employment of more experienced workers or workers in less exposed occupations has remained stable or continued to grow.

While we have yet to see major changes in hiring or industry disruptions due to AI in Virginia, the general consensus is that AI tools have begun to change hiring practices and job requirements for certain occupations and AI will significantly impact certain industries much more than others within the next two to five years. Our surveys and interviews (outlined in Section 2 of this report) confirmed that AI is beginning to change some hiring practices and businesses but that the impacts are not widespread at this point.

Studies continue to demonstrate that workers are increasingly using AI tools in the workplace. In a June 2025 St. Louis Federal Reserve paper called "The Rapid Adoption of Generative AI", the authors found that nearly 40 percent of the working age population (ages 18-64) uses AI and that 23 percent used it in the workplace at least once during the last week.

While workers are increasingly using AI, a recent Pew Research Center survey found that many are not fully comfortable with the technology or hesitant to use it because of concerns that it could make their job obsolete. The Pew study published in early 2025, found that "workers are more worried than hopeful about AI in the workplace." In their survey, 52 percent of workers reported being "worried" about AI and 33 percent described feeling "overwhelmed" by its implications on jobs and the workplace.

It is widely expected that the deployment of AI tools and agents will change many jobs as they exist today, make some jobs obsolete, and create new types of jobs. But the extent to which AI will affect specific occupations and individual positions varies widely based on the type of tasks associated with the job.

A foundational study on AI impacts on occupations by Eloundou et al. found that in general, 80 percent of workers are in roles in which at least 10 percent of the tasks related to the role could involve the use of AI. The same study found that 19 percent of workers are in positions in which over half of all their tasks could be performed by AI.

Impact of AI on Labor Likely to be Greater in Urban Areas

Research indicates that the deployment of AI tools may have a disproportionate impact on occupations and industries concentrated in large cities and metropolitan regions.

A 2024 U.S. Department of the Treasury report, *Occupational Exposure to Artificial Intelligence by Geography and Education*, found that "the highest concentration of AI-exposed workers live in high-density areas."

This trend contrasts with earlier technological revolutions that primarily increased productivity in manual and physical occupations—changes that tended to have a greater effect on rural labor markets.

The June 2025 St. Louis Fed study referenced above reports that workers today are using AI to assist during 1 to 5 percent of their time, which indicates there is room to enhance productivity as AI use in the workplace increases.

Indeed.com's Hiring Lab 2025 report entitled, "AI at Work Report 2025: How GenAI is Rewiring the DNA of Jobs", found that 26 percent of jobs posted on Indeed.com over the past year are "most exposed to significant GenAI transformation" and another 54 percent are "moderately" susceptible to change due to AI tools.

The automation impacts resulting from AI capabilities may potentially affect higher-wage positions that typically require advanced degrees. These impacts are very different than previous technological advancements when operational efficiencies impacted and, in some cases, reduced the number of lower-wage, lower-skill occupations.

As AI models rapidly develop, they're moving from being able to perform routine tasks (i.e., synthesizing information) to non-routine tasks such as creating new information based on patterns in data. This generative AI capability will be used to accomplish decision-making tasks that are now performed by managers and professionals today.

GenAI has also expanded the types of roles that can utilize AI tools. While Science, Technology, Engineering, and Math (STEM) occupations are still somewhat more likely to be exposed to AI overall, studies are showing that demand for AI-specific skills is rapidly spreading to a broader set of occupations. An analysis by the Federal Reserve Bank of Atlanta illustrates that demand for AI skills is spreading to occupations such as life sciences, business and management, and writing "in which the demand for such skills was previously low or virtually nonexistent".

Although the scope of tasks of some occupations will be changed significantly as AI is deployed, it does not mean that workers in those occupations will inevitably be displaced. In fact, for many positions that will be impacted, the automation of routine tasks that workers have been spending time on may enable them to reallocate their time on higher value tasks.

As occupations change, workers will need to develop additional and different skills to be competitive. The World Economic Forum's 2025 Future of Jobs report surveyed business leaders to identify core skills needed for workers to be successful over the next five years. While some of the needed skills are related to technology or are AI-specific, they found most of the skills employers will need by 2030 are more in "human-centric" categories. Specifically, they identify "analytical thinking; creative thinking; resilience, flexibility and agility…leadership and social influence, curiosity and lifelong learning, systems thinking, talent management, and motivation and self-awareness" as skills that will best position workers to be successful in an era of technological advancement.

In a 2025 report entitled "Beyond the Buzz: Developing the AI Skills Employers Actually Need", Lightcast also concluded that "Human skills dominate even in roles explicitly seeking AI expertise, challenging the assumption that AI jobs are purely technical endeavors." Nine of the eleven "Top Skills Required for AI Jobs" are in "human-centric" areas such as "communications", "customer service", "management", "writing" and "problem solving".

Lightcast also points out that the exact skills mix required in the AI-era varies depending on the occupation and even by job type. Because the impacts can vary by job or occupation, delivering the right skills training requires very sophisticated, nimble and responsive training delivery systems. Lightcast advises that "Successful training identifies the two or three AI skill clusters most relevant to target roles and builds genuine competency in those areas while providing awareness-level exposure to others."

AI skills also can make employees more valuable. Lightcast found that as of 2024, job postings listing at least one AI skill pay 28 percent more than those without. Jobs requiring AI skills are not just tech jobs anymore. In 2019 Lightcast found nearly two-thirds of job postings that required AI skills were for technology-related positions but, by 2024, slightly more job postings requiring at least one AI skill today are in non-technology roles than in computer science or IT-based occupations.

Research on AI and Employers

It is generally believed that AI has huge potential for yielding process improvements and efficiencies in firms. A 2025 Accenture survey of 1,500 C-suite executives found that 84 percent of business leaders surveyed believe they will not achieve their growth objectives "unless they scale AI" and 75 percent believe they will go out of business within five years if they fail to do so.

Research on Business Opportunities and Impacts

- Executives report seeing significant potential in AI to improve productivity and innovation
- Many employees remain skeptical, though many are already using AI tools—sometimes informally or without formal approval
- Thus far, AI appears to be affecting tasks more than employment levels, reshaping what workers do rather than eliminating positions
- Early adopters of AI are already realizing productivity gains and strong returns on initial investments
- While efficiency gains are notable, the largest long-term impacts may emerge in product innovation and R&D
- There is currently wide variation in adoption rates, with large firms moving faster than small and mid-sized businesses

Goldman Sachs looked at AI's potential impact on economic growth and concluded that AI productivity gains will increase annual GDP by seven percent globally when fully deployed. Accenture's "AI: Built to Scale" publication reports that companies that have strategically deployed AI business tools are seeing a return on investment of nearly three-to-one and are reporting a "30 percent premium on key economic valuation metrics". A 2025 McKinsey report entitled "The State of AI: How Organizations are rewiring to capture value" reports that while results are early, businesses are reporting seeing both increased revenues and cost reductions across units that are deploying AI tools. A survey of small business owners conducted by US Bank, also found that small business owners who were utilizing GenAI tools reported much greater success than owners not using GenAI for their business.

In a 2022 publication of the National Bureau of Economic Research entitled "New Frontiers: The Origins and Content of New Work, 1940-2018", authors Autor, Chin, Salomons and Seegmiller analyze the labor market impacts of "new work" resulting from automation since 1940 and conclude that such "milestone technologies" ultimately, generally lead to a net increase of workers and a growth in productivity. The World Economic Forum's 2025 Future of Jobs forecasts the net impact of various trends on overall global employment and also concludes that over time, AI will yield more workers and increased productivity.

Despite a longer-term positive outlook on productivity and employment levels, the importance of managing the disruption on individuals, occupations and industries during the AI related transition cannot be overstated. The World Economic Forum's report that cites an overall net increase in jobs over time acknowledges that the transition will eliminate nine million jobs globally while adding 10.8 million new ones.

The Eloundou, et al. study referenced above estimates that 15 percent of workplace tasks overall could be performed more quickly using AI tools. This demonstrates that there is a short-term opportunity for industries to realize operational efficiencies as AI is deployed. Given that workers are currently reporting using AI for 1 to 5 percent of their tasks, efficiencies that can be achieved through the deployment of AI may be especially beneficial to employers in the shorter run.

A potentially even greater impact could result from the use of AI in product development activities. Firms investing in AI and hiring AI-capable talent are demonstrating the ability to shorten the development times of products and they're finding they can use customer data to better assess customer needs and desires to guide the development of products.

A 2024 study by Babina, et al. that looked at the performance of firms investing in AI found that product development impacts are yielding even greater impacts to the business than process improvements. The study found that "as firms invest in AI, they grow larger, gaining sales, employment, and market share. This AI-fueled growth does not appear to stem from cost-cutting; instead, AI-investing firms expand through product innovation and increased product offerings."

A 2024 survey of 100 life science industry executives by the Arnold and Porter law firm found that 75 percent of life science firms are already using AI in their work. Of the firms deploying AI, 79 percent will use it for R&D-related activities including shortening research times through AI-run simulations, designing clinical trials and predictive analytics. Others plan to use it for marketing, business process improvements and product discovery.

Some forecasts suggest that professions that include tasks that are already being impacted by the deployment of generative AI are in the fields of finance, investment, insurance, inventory management and data processing.

Reports currently demonstrate a wide variance in the rate of AI deployment between large firms and small/mid-sized firms. Larger firms with dedicated IT teams and training support are better able to strategically lead AI deployment efforts. A 2025 McKinsey report entitled "The State of AI: How Organizations are rewiring to capture value", found that more than half (52 percent) of large firms have a dedicated AI adoption team to drive deployment and use across the company while less than a quarter of smaller firms had such a team in place. In the previously mentioned US Bank survey of small business owners, more than two-thirds of owners are spending less than $50 per month on AI tools and resources. In this same survey, 56 percent of small business owners are concerned that AI will put them out of business or impacts lines of business.

Research indicates that firms that are strategically leading AI deployment and adoption in a coordinated and centralized way are achieving the best early success. Accenture's "AI: Built to Scale" report refers to this as being "intentional" in efforts to drive AI adoption firm wide. They note that companies need clearly defined structures and governance and that "dedicated AI champions" and "sponsorship from the top" is necessary to ensure efforts are widespread and strategic. MIT's "Leading with AI" guidebook

describes AI as a tool for solving clearly defined business challenges through "system design" and by taking a "firm-level and ecosystem-level" approach to deployment.

Being deliberate about training for employees is also key to successful AI deployment. Some firms – especially larger firms with dedicated training support – are requiring universal AI training across their workforce. Training can be provided through in-house tech support, by technology providers or by third-party training organizations (higher education, for-profit training offerings). While some businesses make training universal, more than four-in-ten of small businesses surveyed by the US Chamber of Commerce about their AI and tech practices report that they are only "providing AI tools to and hoping employees learn to use them." This range of training offerings is similar to what was reported by Virginia businesses (more information in Section 2).

Research on AI Business Expansion and Attraction Opportunities

Chip manufacturing, data centers, cloud storage infrastructure and fiber networks will all need to expand to support the growth of AI. With billions being invested in AI infrastructure annually, this should yield technology-related business attraction and expansion opportunities for the Commonwealth of Virginia.

AI and Business Expansion and Attraction

- States like Virginia, with strong tech talent, robust fiber connectivity, proximity to major data centers, and a well-developed innovation ecosystem, are positioned to attract and grow AI-related jobs and firms
- AI is a key driver of both data center development and the rapid increase in electricity demand
- To date, AI-related venture capital investment in Virginia has been limited, representing a potential opportunity for targeted growth and policy support

Hyperscalers and other technology companies are projected to spend about $400 billion this year on infrastructure to train and operate AI models. Total AI capital expenditures in the U.S. are projected to exceed $500 billion in 2026 and 2027.

Rapidly increasing energy demands associated with AI processing will be a primary factor in determining where data centers are located. In a 2025 report entitled "AI's Power Requirements Under Exponential Growth" from the Rand Technology and Security Policy Center, they found that AI data center energy demand quadrupled between 2023-25 and that it is expected to triple again by 2027 and increase 10-fold by 2030. This capacity does not exist today and long lead times for power generation equipment and lengthy permitting and approval processes leads many experts to believe that the lack of energy capacity may be the greatest risk to rapid AI deployment in the U.S.

The Brookings Metropolitan Project published a report in 2021 that outlined seven factors that were essential for regions to become hubs of AI business development. They evaluated regions by both

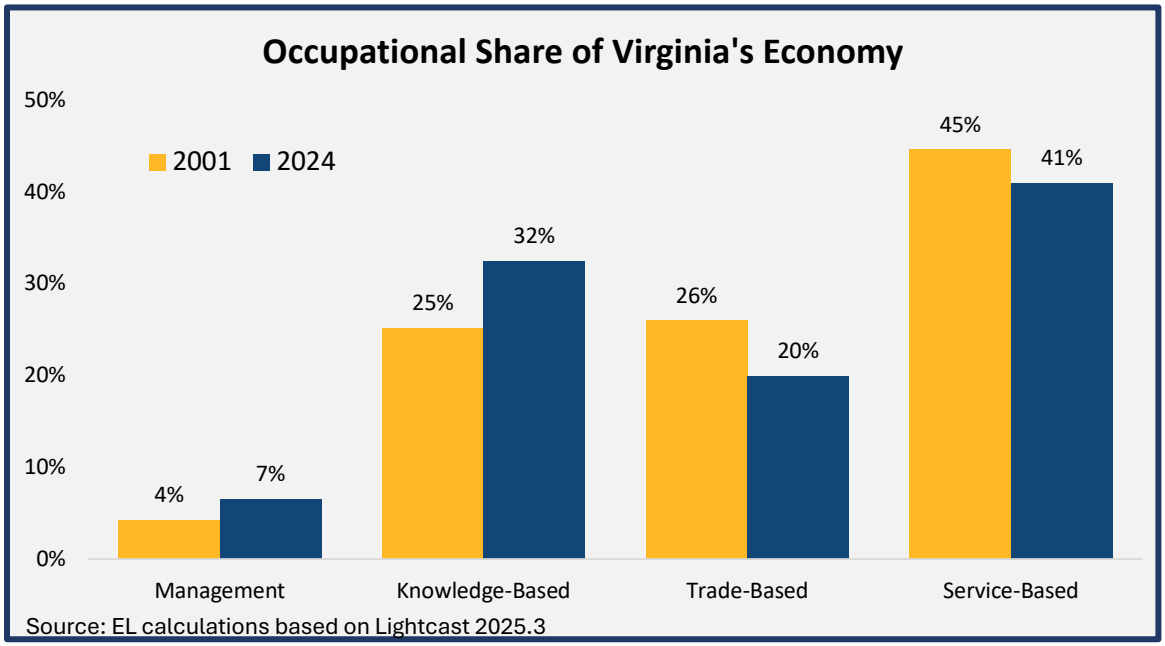
"Research measures that advance the science of AI" and "Commercialization activities that develop new AI solutions for specific business functions". In 2025 they extended their analysis to include "availability of AI talent" and "actual adoption of AI by organizations" as seven additional factors in determining which regions are best positioned to become AI hubs. Two U.S. regions (San Francisco and San Jose) were identified as "superstar" AI hubs and 28 others (including Washington-Arlington-Alexandria) were classified as "star" AI ecosystems that balance "top tier talent, research and enterprise uptake."

Availability of capital is another factor that will determine where AI firms grow and move. A significant portion of venture capital investment during the first part of 2025 has been concentrated in very large AI firms. Pitchbook reported in July that one-third of all VC deals were in AI-related investments with the top three largest U.S. deals all being investments in AI firms. However, despite the heavy concentration of investments in large deals, the State Science and Technology Index (SSTI) also notes that there were also 1,959 investments of less than $100 million in AI firms during the first six months of 2025 indicating a strong pipeline of early-stage AI companies operating across the U.S.

Section 2 – AI Use and Perspectives in Virginia

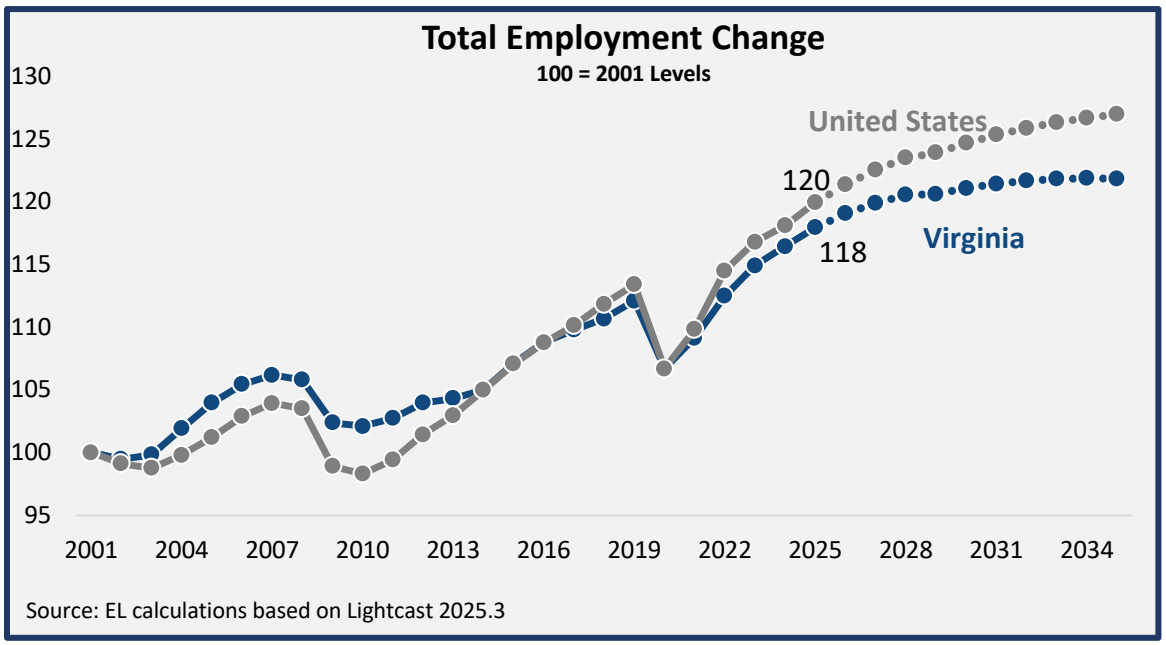
Virginia's Economic Trends

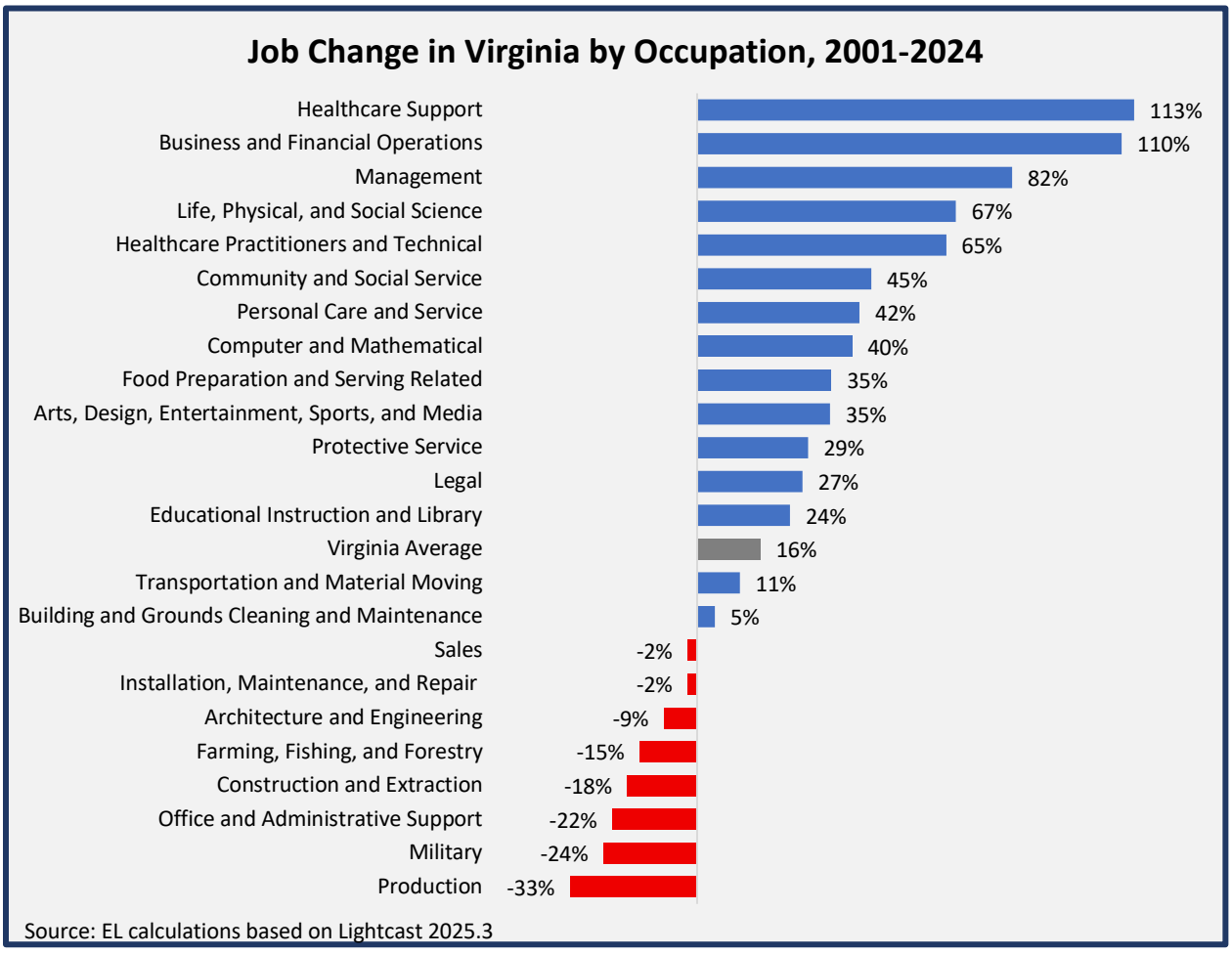
In the last two decades the economy of Virginia has evolved dramatically. Occupations that were once traditional leaders in the state, like trade-based jobs, now account for a lower percentage of the state's economy. Meanwhile, growth has increased the role of management and knowledge-based jobs in the economy. The state has become more reliant on these jobs in fields such as life sciences, tech, and finance to drive the economy. Growth in these knowledge-based positions helped offset job losses in some legacy sectors like manufacturing and agriculture. These knowledge jobs are also among the many jobs needed to serve the government, which accounts for a key share of the jobs in the Northern part of the state.

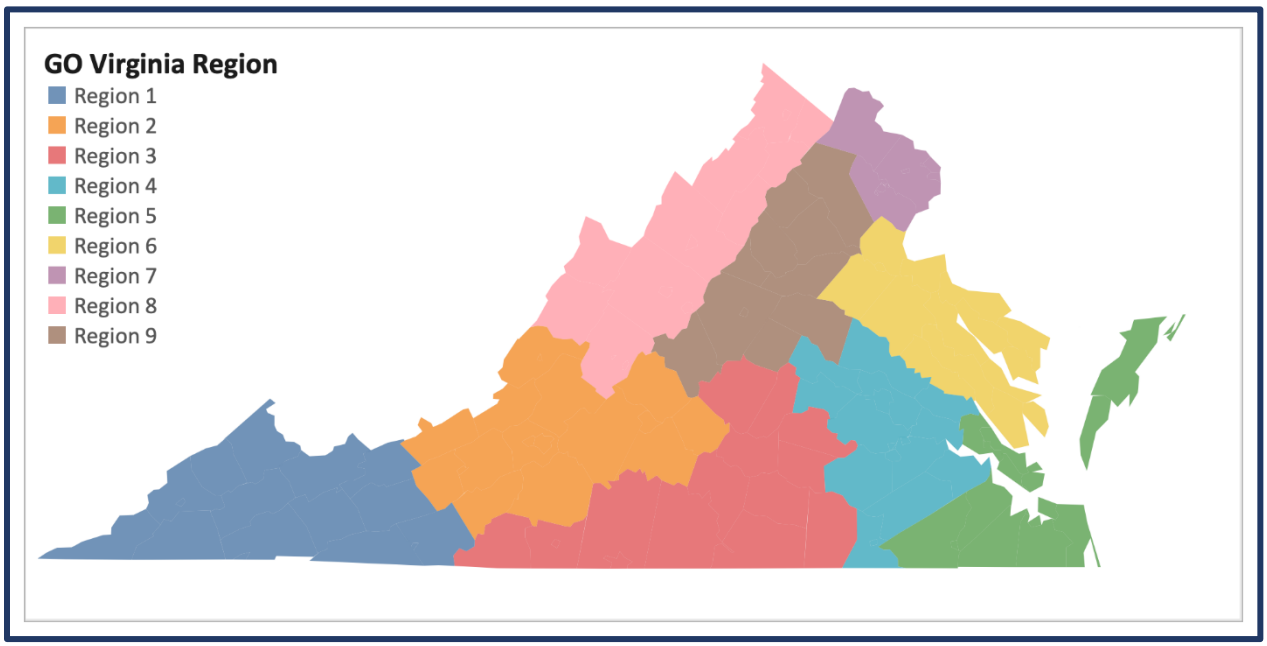


Source: EL calculations based on Lightcast 2025.3

Overall, the economy in Virginia has performed well in the last two decades in terms of job growth. Virginia did not see as significant job losses during the Great Recession compared to the national average. Since 2015, the state has grown at similar rates as the national economy. In the last five years, growth has been slightly slower than the national average.


Total Employment Change
100 = 2001 Levels
130
125
120
115
110
105
100
95
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
2031
2034
United States
120
Virginia
118
Source: EL calculations based on Lightcast 2025.3


Job Change in Virginia by Occupation, 2001-2024
Healthcare Support 113%
Business and Financial Operations 110%
Management 82%
Life, Physical, and Social Science 67%
Healthcare Practitioners and Technical 65%
Community and Social Service 45%
Personal Care and Service 42%
Computer and Mathematical 40%
Food Preparation and Serving Related 35%
Arts, Design, Entertainment, Sports, and Media 35%
Protective Service 29%
Legal 27%
Educational Instruction and Library 24%
Virginia Average 16%
Transportation and Material Moving 11%
Building and Grounds Cleaning and Maintenance 5%
Sales -2%
Installation, Maintenance, and Repair -2%
Architecture and Engineering -9%
Farming, Fishing, and Forestry -15%
Construction and Extraction -18%
Office and Administrative Support -22%
Military -24%
Production -33%
Source: EL calculations based on Lightcast 2025.3

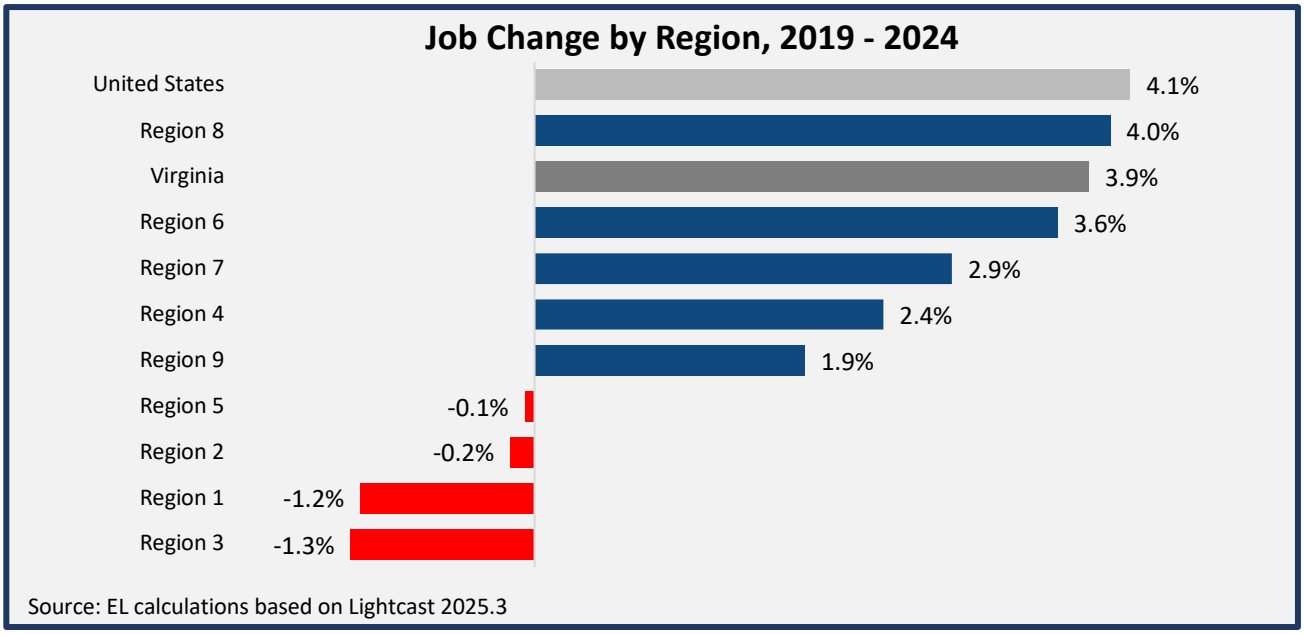


The story within the state is more complex. While some regions in the state have strong concentrations of knowledge workers and have experienced job growth, other parts of the state have much different economies that rely on industries that are shedding jobs like extraction, manufacturing, and agriculture. Due to these differences, four of the GO Virginia regions have experienced net job decline in the last five years while the others added jobs.

Employment Concentration Levels for Selected Industries Across Virginia, 2024

GO Virginia Region	Extraction	Agriculture	Manufacturing	Prof. Services
Region 1	7.12	0.75	1.63	0.35
Region 2	0.20	0.39	1.58	0.65
Region 3	0.39	1.75	1.75	0.36
Region 4	0.18	0.24	0.58	0.93
Region 5	0.04	0.26	0.92	0.92
Region 6	0.31	0.75	0.34	0.98
Region 7	0.08	0.07	0.19	2.87
Region 8	0.27	1.24	1.76	0.39
Region 9	0.34	1.69	0.62	0.92

Source: Lightcast 2025.3



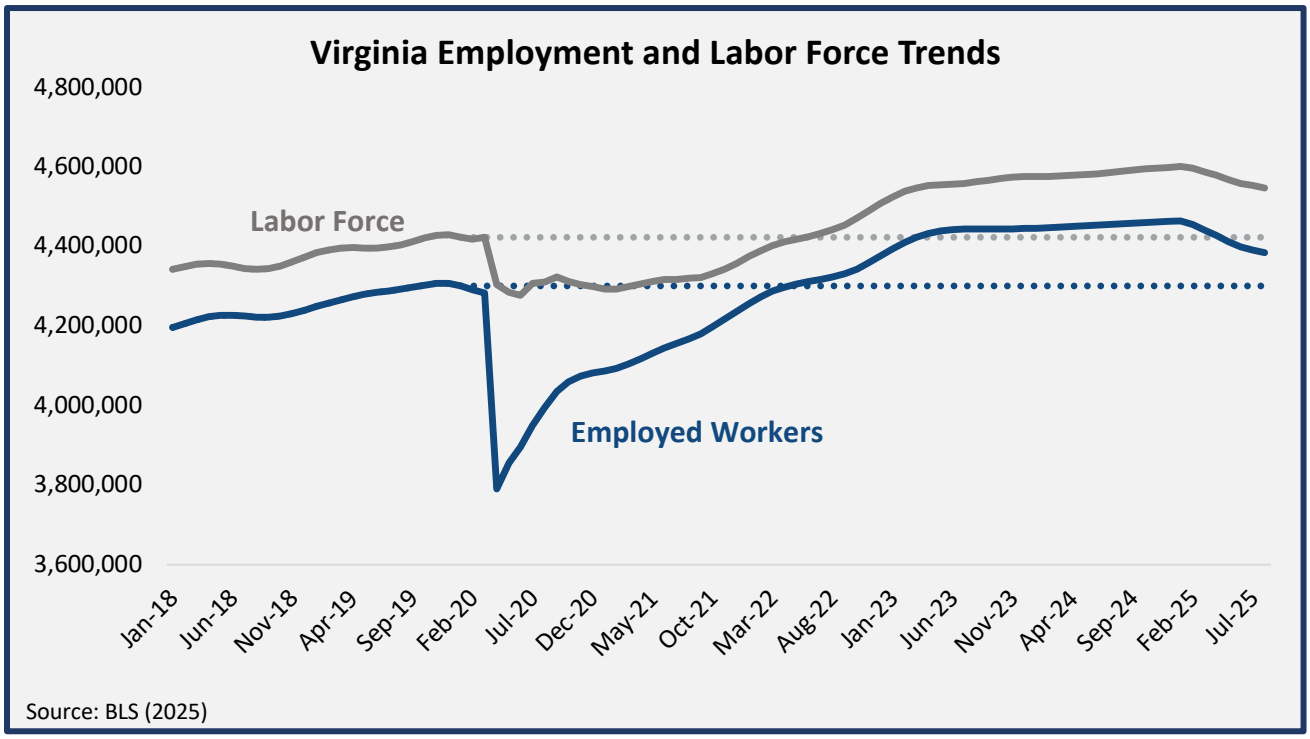
Amongst this climate of Virginia relying on knowledge work to provide growth to the state economy, OpenAI released ChatGPT to the public in November 2022 and potentially created an inflection point to the future of the economy. By mid-2025, the platform had approximately 800 million active weekly users. A Pew Research Center survey found that about 34 percent of U.S. adults had used ChatGPT in 2025, roughly double the usage reported in a 2023 survey. ChatGPT and other large language models (LLMs) have become some of the most rapidly adopted technological advancements of our time.

The rapid diffusion of AI has led to its widespread adoption in the workforce. According to data from Anthropic, the company that developed the LLM named Claude, computer and mathematics workers in Virginia are using Claude for approximately 21 percent of their tasks. Unlike previous efficiency technologies, LLMs automate tasks performed by knowledge workers like writing, editing, and problem solving. Given the state's high concentration of knowledge work, Virginia had the 5th highest usage rate of Claude.

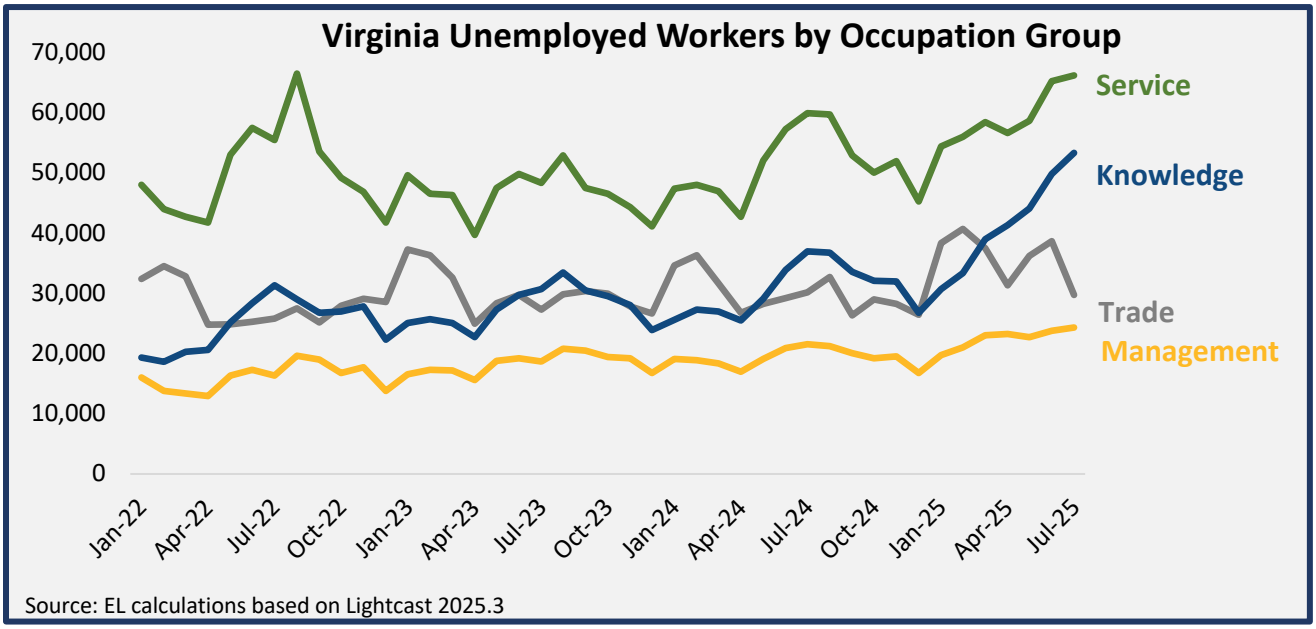
The debate over whether new LLM tools will automate tasks and replace workers or merely augment tasks to increase efficiency is ongoing among researchers. Some studies warn that AI could replace substantial portions of the workforce, while others suggest that AI may provide productivity gains but

have little to no impact on overall employment. This report reviews this research and creates a range of jobs in Virginia that could be exposed to AI.

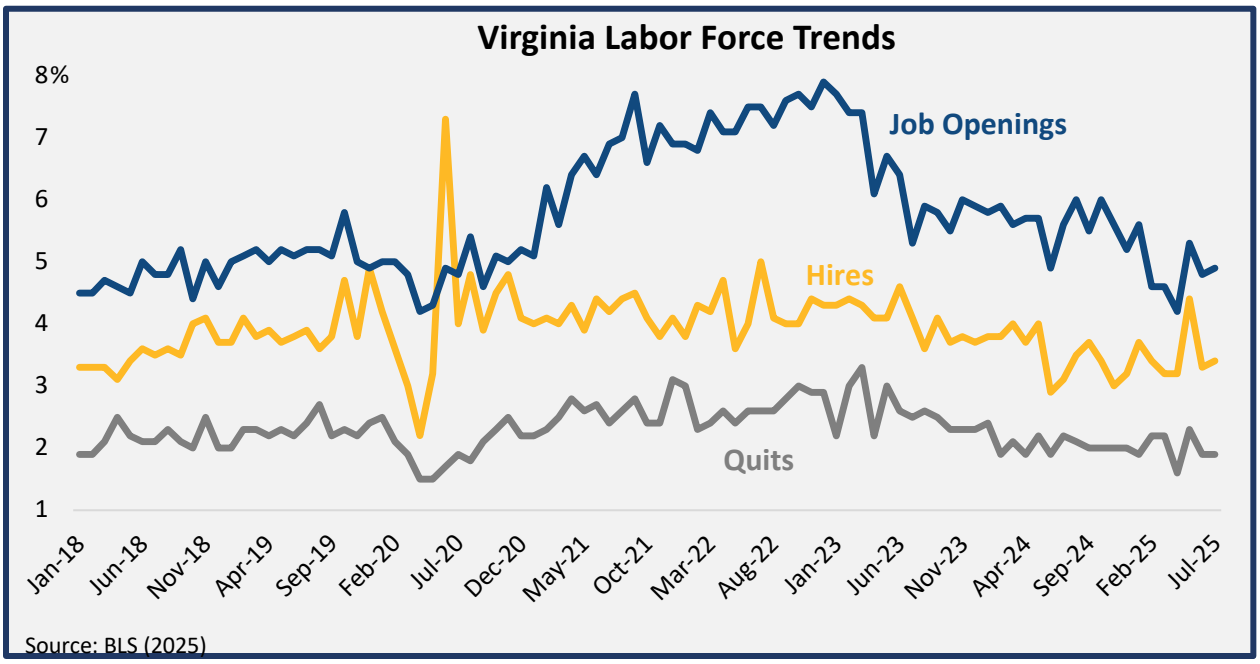
While the research continues to better understand impacts, there are potential signs that AI is starting to impact Virginia's economic data. Virginia had recovered from the shock of the pandemic, but the size of labor force and employed workers has started to fall in recent months. There are several potential explanations for these changes beyond AI that include government spending cuts, international trade policy changes, and an overall change in the business cycle toward recession.



Diving deeper into the unemployment data reveals that more knowledge and management workers are out of work than they have been in recent years. This could be an indication that knowledge workers are having a harder time than trade jobs in today's economy, which have not experienced the same jump.



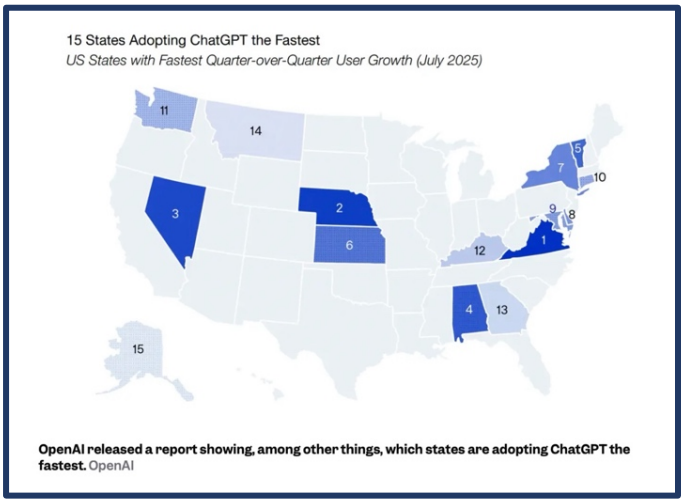
Despite these recent dips in job numbers in the state, the rate of job openings in the state remains above hires. This indicates that while some sectors of the economy are shrinking, others are looking for workers and expanding. This gap highlights how skills mismatches in the labor force are limiting the potential for further job growth.



These economic trends highlight the importance of understanding which parts of the economy could be most impacted by AI advancements and the need to continue to align workforce training to the meet the needs of employers in the state.

AI Perspectives Across the Commonwealth

To understand the current landscape as it relates to AI use and deployment in Virginia, employers were interviewed and surveyed, and additional input was gathered at many of the Virginia Chamber of Commerce's Blueprint Tour stops in each of the GO Virginia regions

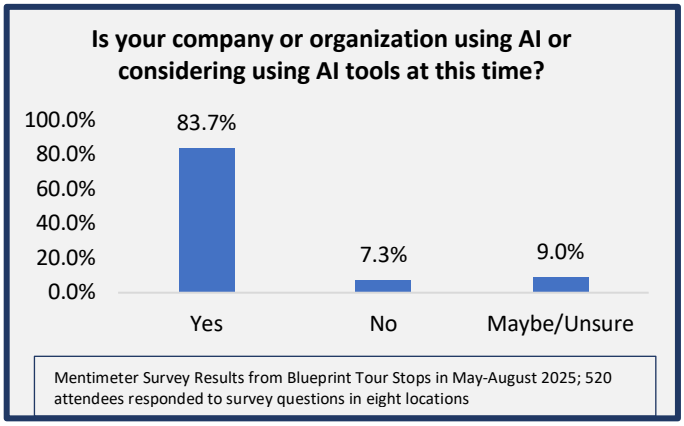


Virginians are using AI at rates greater than most other states. OpenAI reported in July 2025 that Virginia had the highest quarter-over-quarter growth in use of ChatGPT among all states. This same report illustrated that ChatGPT's users in Virginia are predominately using the tool for learning and upskilling, writing and communications and programming/data science/math activities.

Anthropic recently reported on use of their GenAI tool, Claude, by state as well and Virginia ranks 5th in Anthropic's AI Usage index. Anthropic's data also indicates that AI use is most prevalent among tech firms, arts/design/entertainment organizations, education, and among the sciences in Virginia and that users in Virginia are using AI 50 percent of the time to augment existing tasks and 50 percent of the time to automate tasks.

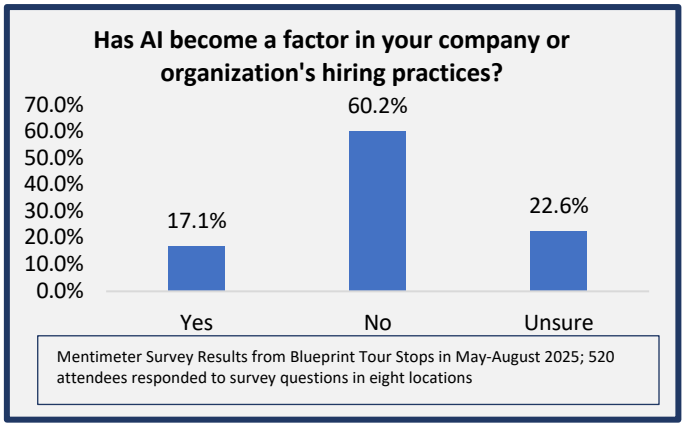
AI Perspectives at Blueprint Tour Stops

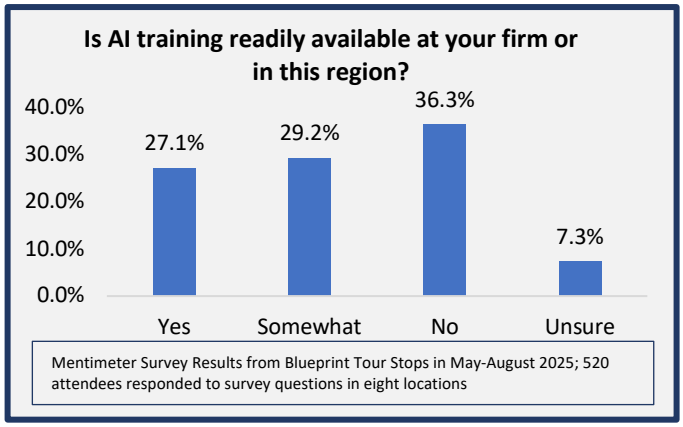
As part of the AI landscape assessment data gathering, Economic Leadership attended the Virginia Chamber of Commerce's Blueprint Tour stops held in the 9 GO Virginia Regions across the state and collected AI-related feedback from 520 attendees.



A very high percentage (83.7 percent) of Blueprint Tour attendees represented organizations that have begun deploying AI or that are considering deploying AI. This rate of deployment is much higher than the U.S. Census Bureau's employer surveys and higher than other estimates indicating that Blueprint Tour attendees are extremely focused on AI deployment in their organizations. AI use was reported to be slightly lower among attendees at Blueprint Tour meetings in Manassas, Fredericksburg and Danville but all still reported usage rates of over 78 percent.

Blueprint Tour stop attendees also were asked whether AI has impacted their organization's hiring practices. Less than one-fifth of respondents indicated that their firm had adjusted hiring practices due to AI and another one-fifth were unsure. More than 60 percent of attendees said that AI has not yet impacted their number of hires, or the desired skills mix in job postings. Of the regions where Blueprint Tour stops were held, the attendees citing the highest level of impact on job postings were at meetings in Tyson's Corner (30 percent), Manassas (22.8 percent) and Norfolk (21.6 percent). The regions with the lowest reported impact on job postings were in Lexington (5.8 percent), Danville (9.1 percent) and Charlottesville (12.1 percent).





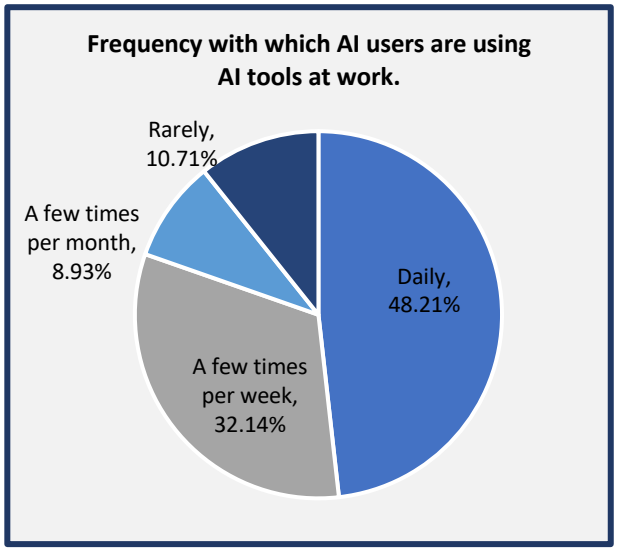
Blueprint Tour attendees were also asked about the availability of AI-related training resources in their region. Highlighting an area of focus for additional resources, only 27 percent of respondents indicated that training resources were readily available. More than one-third of organizations indicated they are not aware of training resources, and another 29 percent indicate that training resources are only "somewhat" available.

Of the various Blueprint Tour meetings, the areas with the highest availability of training resources were reported in Tyson's Corner (44 percent), Richmond (35.5 percent) and Manassas (31.3 percent). The regions with the highest combined rate of "yes" and "somewhat" were recorded at meetings in Lexington (82.3 percent), Tyson's Corner (72.9 percent), Richmond (77.4 percent). The lowest reported availability of AI training resources was reported at meetings in Fredericksburg (50.8 percent), Danville (50.6 percent) and Norfolk (39.1 percent).

AI Landscape Assessment Survey

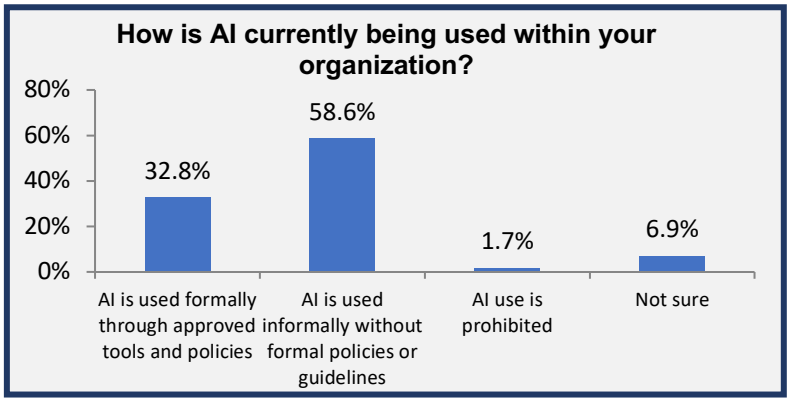
A more extensive survey instrument was developed to obtain additional information about AI use and adoption across the Commonwealth. The survey was shared with employers by GO Virgina regional directors during July 2025. A total of 58 employers responded to the AI landscape survey.

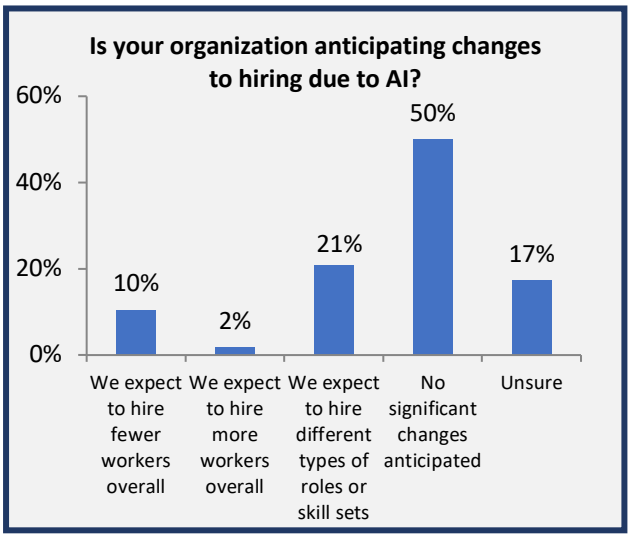
The survey reveals that AI adoption is already widespread, with 95 percent of respondents reporting current use of AI tools, often on a daily or weekly basis. Most participants (62 percent) view AI as an opportunity, though usage is largely informal (59 percent without policies) and ROI measurement is limited (46 percent not tracking). While some organizations are beginning to adapt hiring and training practices, large gaps remain in formal workforce development. Respondents emphasized the need for practical, sector-specific training, leadership guidance, and statewide collaboration to ensure Virginia remains competitive in an AI-driven economy.



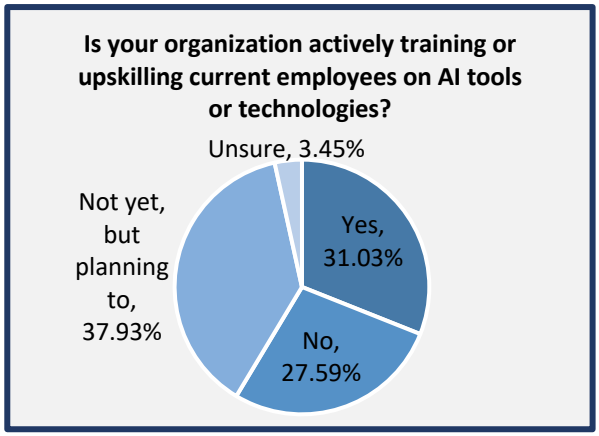
Five Main Survey Takeaways:

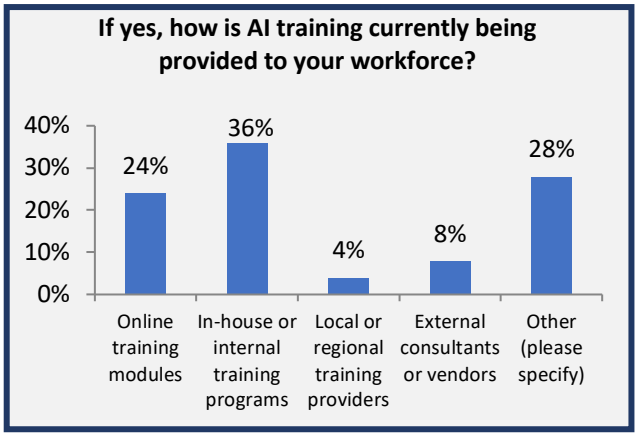
- **AI Adoption Is High but Informal** – Nearly all respondents (95 percent) use AI at work, with 48 percent using it daily. However, 59 percent said their organizations use AI without formal policies, and only seven percent track ROI with clear metrics.



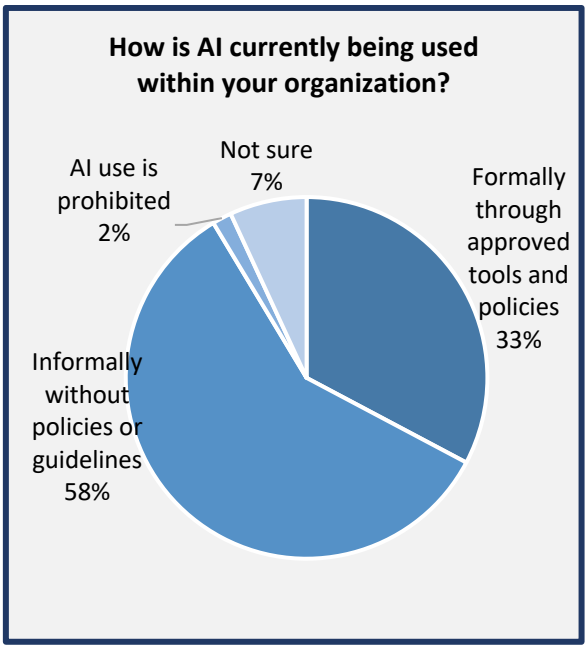


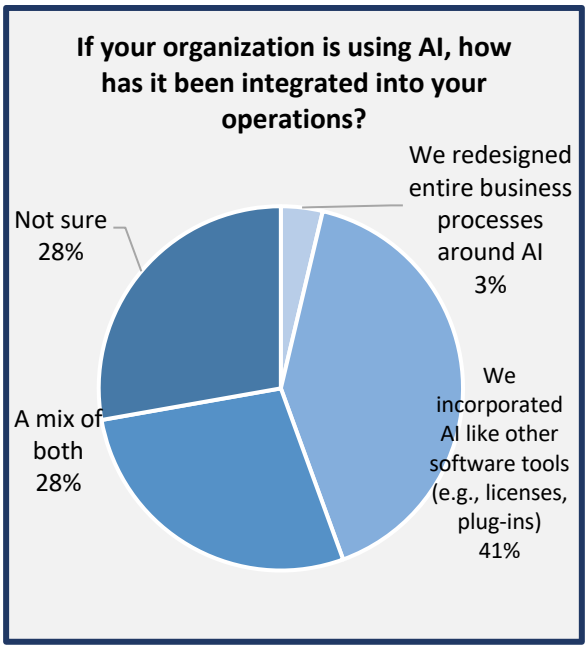
- **Training Gaps Are Significant** – Just 31 percent of organizations are actively training employees on AI, while 38 percent are still planning and 28 percent offer none at all. Training is often ad hoc: many respondents cited informal knowledge sharing as their current method.





- **Hiring and Skills Needs Are Shifting** – Only 10 percent expect to hire fewer workers overall due to AI, but 21 percent anticipate hiring for new roles and skill sets. Meanwhile, 33 percent are seeking AI skills across most roles, yet 24 percent remain unsure of their hiring approach.
- **Leaders Need Practical, Hands-On Support** – Survey respondents stressed that managers and executives require real-world examples, sample policies, and "sandbox" experimentation. Currently, just 36 percent of training is delivered in-house, and only 4 percent comes from local/regional providers, suggesting a gap in leadership-focused resources.
- **Collaboration and Guardrails Are Priorities** – While 83 percent of survey respondents report co-workers are also using AI, many warned about ethical, security, and cultural risks. Recommendations included closing adoption gaps (especially among women), launching regional AI hubs, and establishing statewide guidelines to ensure responsible, inclusive use.





Interviews and Feedback from Across the Commonwealth

In addition to the Blueprint Tour stops and surveys, interviews and focus groups were conducted with 38 participants across all nine GO Virginia regions. Eight key themes emerged from the interviews and focus groups:

8 Key Interview Themes	Quotes from Interviews and Focus Group Participants
The opportunities and impacts related to AI in Virginia are just beginning to come into focus	○ "There's no playbook for this and Virginia, like every other state, is 'building the plane as we fly it'." ○ "Owners are often ready to embrace AI but workers are reluctant – the mismatch needs to be addressed." ○ "We're at the point of just getting people to understand what AI and GenAI are." ○ "Gen AI is not a solution. It is a tool to get to a solution."
Workers need to be "AI literate" and need clarity (and encouragement) on AI use in the workplace	○"A good place to start would be ensuring that employees at all levels have foundational training in AI – AI101, data literacy, ethics" ○"It's the 'Wild West' out there with some workers using sanctioned AI tools, others using them on their own and still others being scared of them altogether." ○"For the last century, we have taught our workforce to be makers. Now we need to teach them to be thinkers, problem solvers."
Gen AI is "next level AI" and requires a different set of workforce skill sets then previous AI	○"To be effective in Gen AI, we need to demystify critical thinking. We must teach people how to think." ○"Effective use of it requires strong critical thinking skills. You need to know the best questions and give the best directions in order get the best answers/solution. And critical thinking is not something we typically teach." ○"Gen AI is built on *prompt engineering,* and you need to ask the right prompt in order to train AI to utilize the universe (industry) that you're in." ○"The biggest misconception of AI is that it thinks for you. It only thinks about what you feed it. If you put garbage in, you'll get garbage out."

High likelihood that jobs will change, some jobs will disappear, and new jobs will be created	○ "There will be jobs tomorrow that we haven't even thought about today." ○ "AI is not going to replace your job but people who know how to leverage and use AI will." ○ "There is such a shortfall of labor in some fields that AI productivity gains will help address before it takes any jobs."
The training resources are not fully in place today and the ones that are will be challenged to respond to the volume of demand and pace of technological change	○"Education at every level will need to be involved." ○"Business schools need to be in the mix of training because most workers don't need to know how to build a bot but rather how to deploy the tool." ○"The Governor issued an executive order to all VA K-12 school districts to develop curriculum and process to provide Gen AI literacy. It includes all staff and students and is underway in many VA school districts in the 25-26 school year."
AI offers huge benefits for businesses but AI deployment needs to be strategic and integrated to be most successful	○"Because AI impacts each industry differently, training and support needs to occur by industry – maybe through organizations like trade associations, the VEDC and the state chamber." ○"Regular communication of AI guidelines and updates has been key to driving adoption and use." ○"Gen AI's impact in the Health care industry has been a very positive one. It has helped us day to day to be faster and better. It has made our workforce more effective, productive and accurate."
Virginia has a unique opportunity to benefit from AI that many other states do not (if the infrastructure is there to support)	○"Virginia has the 'total stack' to lead in AI: developer power, federal research demand, federal contractors doing complex work, digital infrastructure." ○"Entrepreneurial education and support for entrepreneurs will help grow new AI businesses." ○"There won't be business expansion or new AI businesses relocating to Virginia if we don't have enough electricity and fiber."

Finding the right tone of policy and regulatory engagement for AI will be an important determinant of how effectively it is utilized	○"Effective policy guidelines on the application of AI in VA should be developed not by legislators, but by a collaboration of industry, academic and military experts who can guide the state in an experienced way." ○"State leadership needs to engage industry as partners in developing policy that will govern AI's utilization to ensure its utilized ethically, but equally important, that it is utilized to its fullest capacity to ensure the economic competitiveness of the state."

Throughout the stakeholder and industry engagement, several consistent themes and challenges emerged. The recommendations outlined in Section 5 of this report directly reflect the issues and opportunities raised by the hundreds of Virginians who participated in the Blueprint Tour stops, employer surveys and interviews and focus groups across the Commonwealth. This input, combined with the asset mapping (Section 3) and impact forecasting (Section 4) will help policy makers, business leaders and educators address issues and build upon opportunities as the pace of AI deployment increases.

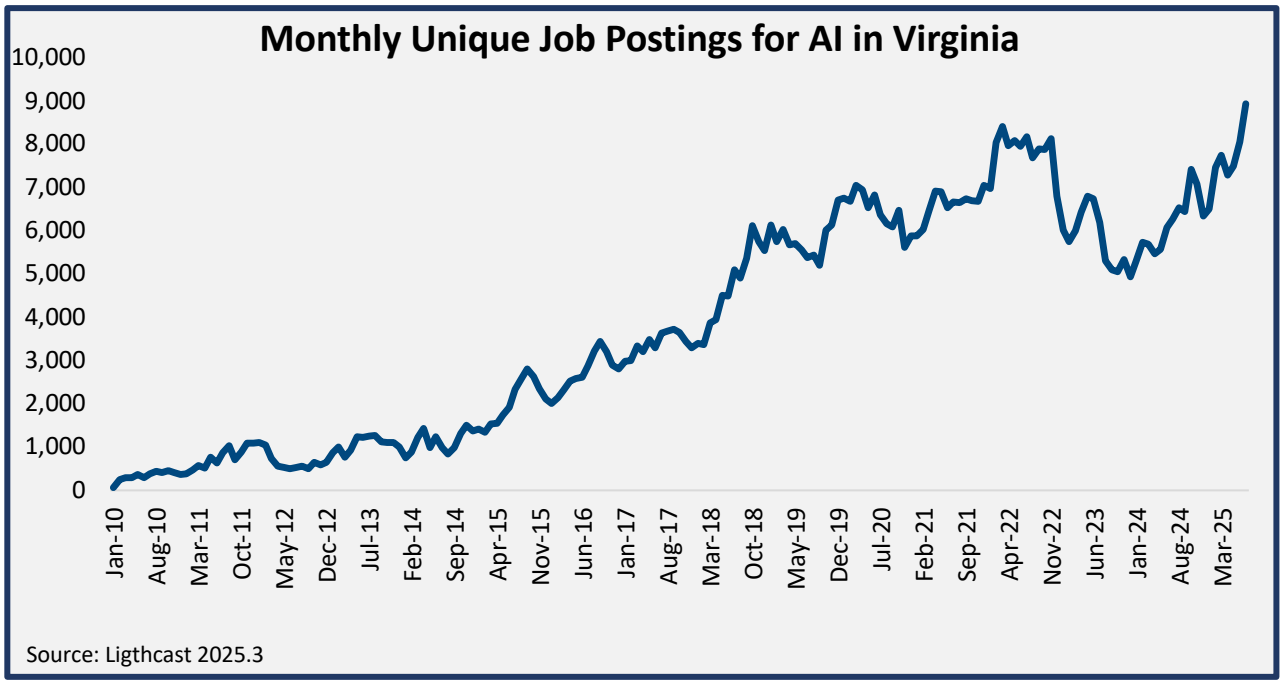
Section 3 – Virginia AI Asset Mapping

Section 3 reviews the growing demand for AI training and resources and summarizes the existing programs and resources in Virginia that are and will be important as AI use and deployment increases across the Commonwealth.

Demand for AI and AI Adoption in Virginia

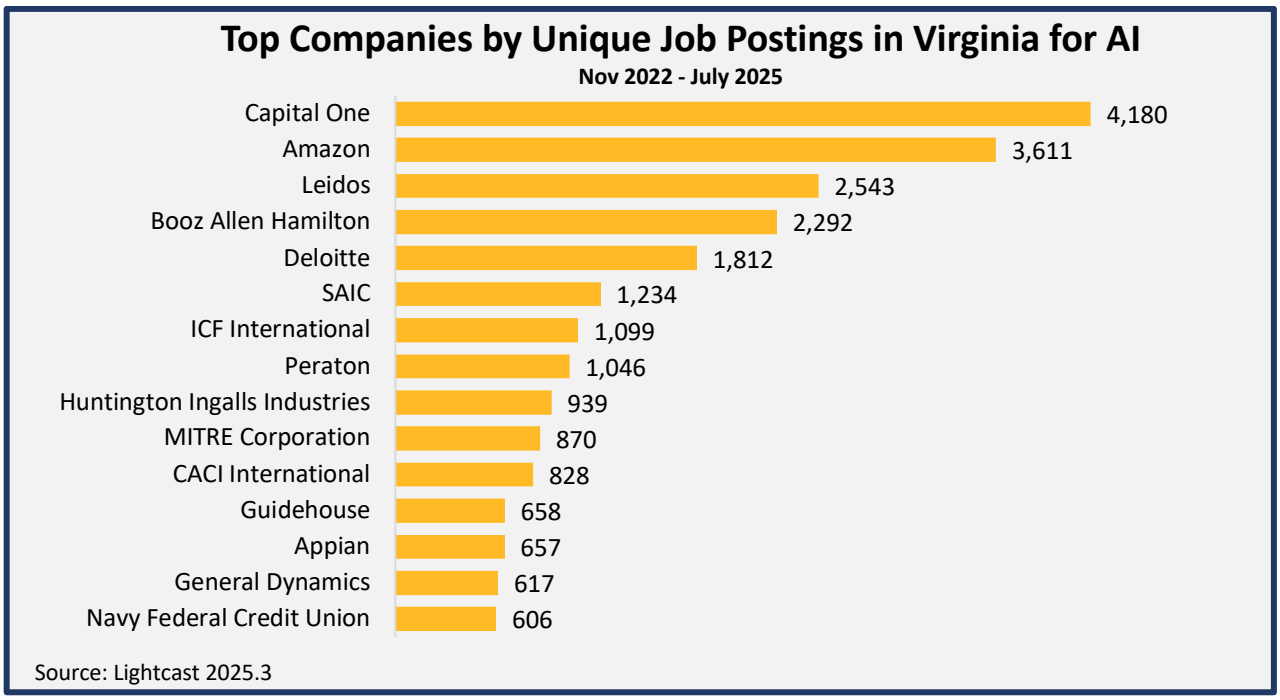
While much is being discussed about the potential negative impacts of AI on the workforce, many also believe that AI can be a technology that creates new demand in the economy. Harvard economist Jason Furman recently reported that almost all US GDP growth in the first half of 2025 was driven by AI investments. This includes the investments in the data centers needed to power current and future AI products. Without this investment GDP growth during this time could have been as low as 0.1 percent compared to the previous year. AI investing is currently carrying the US economy and could be a crucial piece of future growth.

The need for highly specialized talent that can help develop and maintain these AI tools is growing. In July 2025, there were 8,940 unique job postings in Virginia that mentioned AI in the job description. This was the highest monthly demand going back to the starting point of online jobs postings data in 2010. The time series of job postings might indicate that the demand has recovered from the downturn in 2022 when the Federal Reserve increased interest rates and slowed venture capital investing.

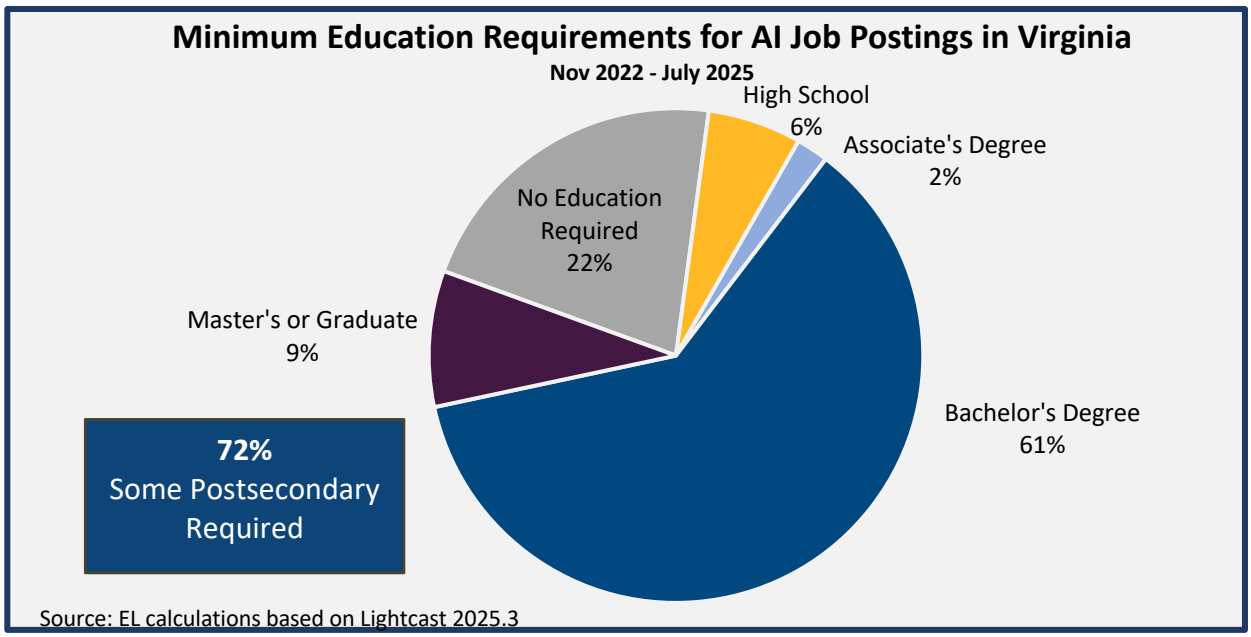


From November 2022, the public launch of ChatGPT, to July 2025, there were 89,770 unique job postings for AI talent in Virginia. About 6,350 different employers were competing in the state for AI talent. Some of the top companies seeking talent are finance, consulting, and defense companies. The

average advertised salary for AI job postings in Virginia was $150,400 in July 2025. These types of jobs certainly offer economic security for those who have the skills.



Nearly three-quarters of these AI job postings required some form of postsecondary education at a minimum to be considered for the position. About 61 percent of all the AI job postings required a bachelor's degree.



One of the top certifications required in many of these AI postings is a security clearance. This highlights the prominent role of the government contractors and defense firms are playing in the utilizing of AI. The jobs posting data also shows that cities in Region 7 are among the top areas looking for AI talent. Efforts to expand access to AI training could help improve employment prospects of Virginia's workers given this growing demand.

Top Cities for AI Job Postings in Virginia, Nov 2022 – July 2025

City	Unique Postings	Region
Arlington	12,449	Region 7
McLean	10,213	Region 7
Richmond	8,701	Region 4
Reston	6,489	Region 7
Herndon	5,246	Region 7
Chantilly	5,175	Region 7
Fairfax	2,913	Region 7
Springfield	2,830	Region 7
Alexandria	2,826	Region 7
Norfolk	2,187	Region 5
Virginia Beach	2,050	Region 5
Vienna	1,930	Region 7
Charlottesville	1,644	Region 9
Falls Church	1,574	Region 7
Ashburn	1,346	Region 7

Source: Lightcast 2025.3

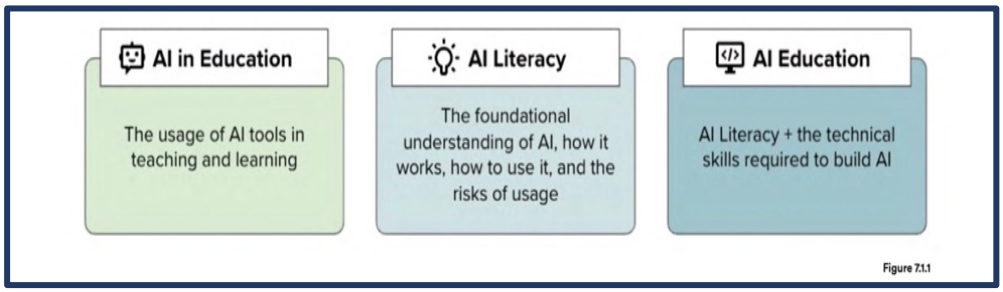
Virginia's AI-related Workforce Training Resources

Three state agencies are especially critical to AI-related workforce efforts and multiple efforts have been launched over the past two years.

- **Virginia Department of Workforce Development and Advancement known as Virginia Works** - Virginia Works is Virginia's workforce development agency, with a stated mission to "connect people to careers and employers to skilled talent". Virginia Works coordinates training, runs the "Virginia Has Jobs" job board, and recently led the establishment of an AI career launch pad in partnership with Google to help workers obtain skills to "unlock new career possibilities in Virginia's AI powered economy."
- **Virginia Department of Education (VDOE)** – VDOE's Office of Innovation and Office of Educational Technology and Classroom Innovation have led initiatives to establish AI integration guidelines as well as creating training for teachers and school administrators throughout the Commonwealth.

- **Virginia Department of Housing and Community Development (DHCD)** – DHCD's Division of Economic Development and Community Vitality administers the GO Virginia program which is described as "Virginia's initiative for growth and opportunity in each region". Each of Virginia's nine GO Virginia regions. With a state oversight board and regional boards that include employers, educators, policymakers, and government official, they work to align resources to create economic and community opportunities.

In examining the availability of AI workforce training resources, this analysis uses the framework used by Stanford's Human-Centered AI 2025 AI Index Report to differentiate between AI in Education, AI Literacy and AI Education Workforce programs. As the recommendations in Section 5 demonstrate, all three areas are important for ensuring Virginians are as prepared as possible to take advantage of AI opportunities.



AI in Education

To encourage the use of AI in education for teaching and learning, in January 2024, Governor Youngkin issued Executive Order 30 on Artificial Intelligence, which put forward the official *Guidelines for AI Integration Throughout Education in the Commonwealth of Virginia*.

Key principles from this order include:

- A requirement to ensure AI integration is done ethically and safely.
- Guidance to protect student privacy and data by upholding state and federal policies.
- A commitment to academic integrity and addressing issues of cheating and plagiarism.
- An assurance that AI shall augment, not replace, teachers by utilizing AI to streamline tasks and enhance learning, while preserving the critical human element of education.
- A focus on harnessing AI to empower students, enabling more personalized and adaptive learning experiences.

To help administrators and teachers understand how to use AI in education, the Virginia Department of Education (VDOE) has launched several initiatives:

- **Generative AI workshops:** In fall 2024, the VDOE collaborated with multiple community colleges to offer targeted, hands-on workshops for K–12 educators, training 360 teachers in AI-driven instructional strategies.

- **Year of Learning leadership initiative:** The VDOE partnered with the Virginia Association of School Superintendents (VASS) to help 75 school systems develop comprehensive plans for AI integration.
- **AI Advisory Committee:** This committee provides strategic recommendations to the VDOE and advises on integrating AI responsibly.

While the Commonwealth's decentralized public education structure makes widespread efforts somewhat more challenging to direct, VDOE reports significant interest among administrators and teachers. To achieve broad success, it will be important to ensure all 132 school divisions are motivated to participate in AI training and advisory initiatives.

AI Literacy

To provide Virginians with a foundational understanding of AI, Virginia Works, in partnership with Grow with Google, announced an "AI Career Launch Pad" in July 2025 as a free online resource "to help Virginians explore, learn, and connect to high-demand AI and tech-related opportunities." Beginning courses in AI Essentials and Prompting Essentials as well as more advanced training that can lead to Google Career Certificates in fields such as cybersecurity, data analytics, and project management are available at www.VirginiaHasJobs.com/AI.

Many public-school divisions and VDOE are focused on ensuring the future workforce in grades K-12 are AI literate. However, as noted above, ensuring widespread adoption of AI literacy and use across all school divisions will be important to achieve to meet the goal of universal AI literacy throughout the Commonwealth.

Providing AI literacy for incumbent workers involves both traditional workforce training partners and new training resources and partners. As demonstrated in surveys and interviews, many employers reported that sufficient training capacity is not available and/or it is not apparent how to access training resources in their region. To achieve universal AI literacy among those in the workforce already, training options will need to include:

- **Access to online training modules** – numerous online training modules are available through AI and other technology providers on the internet and through YouTube that can be accessed in many cases at no cost; the above-mentioned Virginia Works partnership with Go With Google is one of many examples of online training that is available from technology providers.
- **In-house, employer provided training** – about one-third of employers surveyed reported providing training using in-house resources; one large employer interviewed for this landscape assessment described a business-wide requirement for all employees to obtain AI literacy training
- **Traditional workforce training partners such as community colleges** – Some community colleges have begun offering introductory training and workshops in their regions. For example, Germanna's Academic Center for Excellence offers AI literacy training for students and faculty. Central Virginia

Community College and Laurel Ridge Community College have periodically offered brief introductory AI workshops to the public.

- **Colleges and universities** – through incorporating AI in the classroom to having clear and consistent policies for AI use for students, Virginia colleges and universities have a huge role to play in developing the AI literacy among students; additionally, in an announcement in August 2025, Google agreed to provide all college students in Virginia access to Google AI Pro and free AI training modules. Additionally, three institutions of higher education (Bridgewater Community College, Northern Virginia Community College and University of Virginia) are part of Google's first cohort of Google's AI for Education Accelerator which gives students at those institutions free access to Google Career Certificates and additional AI training modules.
- **Regional AI and Tech Consortia** – tech councils and AI-specific coalitions in some regions can serve as a training resource and help raise awareness on AI-related issues at the regional scale. A great example of a regional AI coalition is the AI Ready VA organization founded by volunteers in 2024 to "transform Richmond into a thriving hub for AI education and application". AI Ready VA regularly offers both general and sector-specific AI training programs in the Richmond region.
- **Public Libraries** – a few public libraries in Virginia have offered beginning AI workshops. Some examples include: an "Introduction to Generative AI" class offered at the Loudoun County Public Library, a "Foundations in Generative AI" class at the Henrico County Public Library, and an "AI and Genealogy" workshop planned at the Fairfax County Public Library.
- **Virginia's Small Business Development Centers (SBDCs)** – The Virginia SBDC offers many online training courses focused on AI for beginners and on ways to utilize AI for business success. Examples of courses offered by the Virginia SBDC include: "AI for Business Growth", "Using AI Tools for Social Media Success" and "Marketing with AI". The Central Virginia SBDC is one of a limited number SBDC office locations that have begun offering in-person AI workshops and training for small businesses.

While there are many free and low-cost foundational AI training resources available throughout the Commonwealth, they must also be well promoted and easily accessible to move Virginia toward a goal of universal AI literacy.

AI Education

Efforts to train K-12 and post-secondary students in the field of AI are somewhat limited in Virginia right now.

While Virginia is one of only five states that include AI-specific content in their K-12 Computer Science educational standards, only 68 percent of Virginia school divisions offer computer science courses. Maryland and Arkansas lead the nation with 100 percent of school districts offering computer science courses. In 2024, 5 percent of Virginia students enrolled in a computer science course which just slightly trails the U.S. average of 5.1 percent. South Carolina (26 percent of students) and Arkansas (20 percent) are the leading states for computer science course enrollment.

Virginia has an extensive network of 23 community colleges with 40 campuses throughout the Commonwealth. Virginia's Community College System has established a strategic vision that outlines how the system and colleges will operationalize AI and has developed policies to govern responsible AI use and facilitate AI knowledge sharing and deepen industry partnerships. However, at this time there are few AI-related degree or certificate programs offered at Virginia community colleges. Northern Virginia Community College has an Artificial Intelligence and Data Analytics certificate program, and Central Virginia Community College has begun offering a Microsoft AI Certification Badge through a 3-week program. Laurel Ridge Community College offers an AI and Machine Learning certificate program that is available online. An "Introduction to AI" course is offered through various institutions on the Ed2Go.com platform.

Most of Virginia's fifteen four-year institutions of higher education offer bachelor's and advanced degrees in Computer Science and Computer Engineering and many offer majors, or minors in Data Science. Cybersecurity degree programs are strong and prevalent across four-year universities in Virginia as well. Many colleges and universities in Virginia have AI courses and some also have faculty and students working on AI-related research. However, the number of AI degree programs at Virginia colleges and universities is very limited with only Hampton University and Marymount University offering bachelor's degrees in Artificial Intelligence and George Mason offering a Master of Science in Artificial Intelligence Degree. Several colleges and universities offer minors, certificate programs or "focal paths"/ "tracks of study" in AI or Machine Learning. Virginia Tech and the University of Virginia have AI-related Centers.

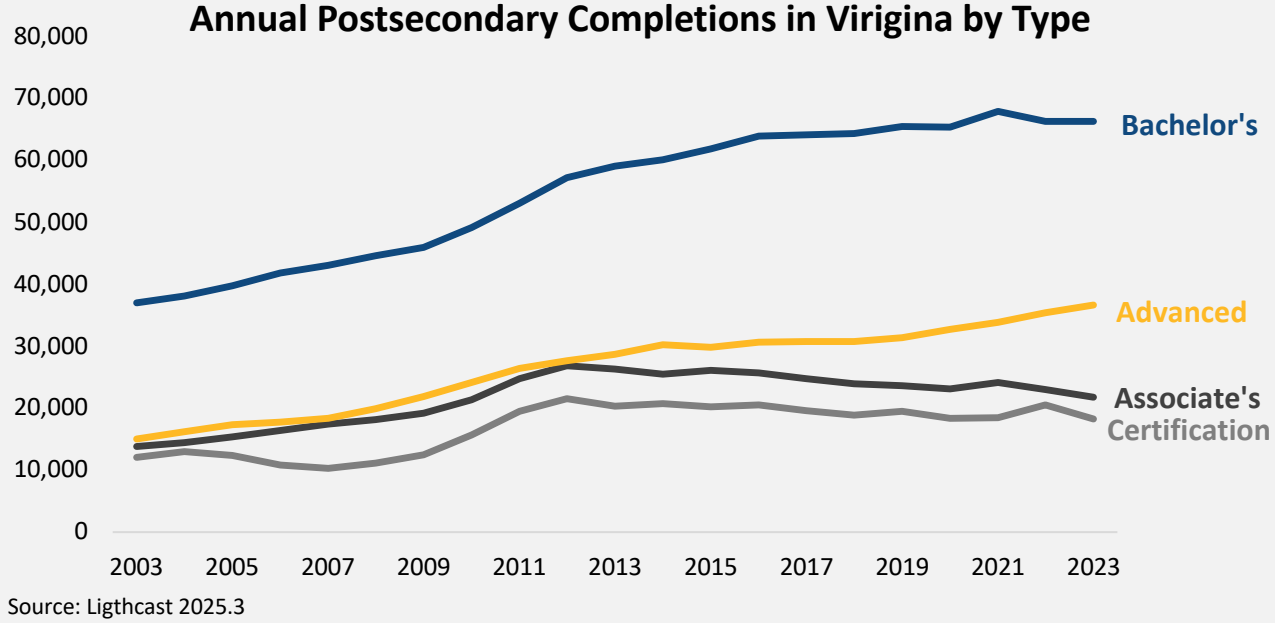
Despite the limited number of AI degree programs, the ability of Virginia colleges and universities to train tech talent has been a key factor in Commonwealth becoming a hub for technology businesses. The number of certificates and degrees offered and the volume of graduates in programs such as Data Science, Computer Science, Computer Engineering, Computer and Information Science and other related fields will help support the technology workforce needs of AI firms in Virginia.

In October 2025, Old Dominion University announced a partnership with Google to establish the MonarchSphere AI incubator which is described as the "first-ever [AI] incubator in higher education". The goal of the partnership is to "create and accelerate AI-driven solutions" that support student learning, faculty teaching and research as well as industry partners.

One of the best tools for filling AI-related openings is a steady pipeline of well-trained workers graduating from local postsecondary institutions. Local high schools can also provide training programs, though many of these programs are not easily quantified as postsecondary programs can be. This section reviews the historical trends of Virginia's postsecondary institutions and the talent that is currently being supplied.

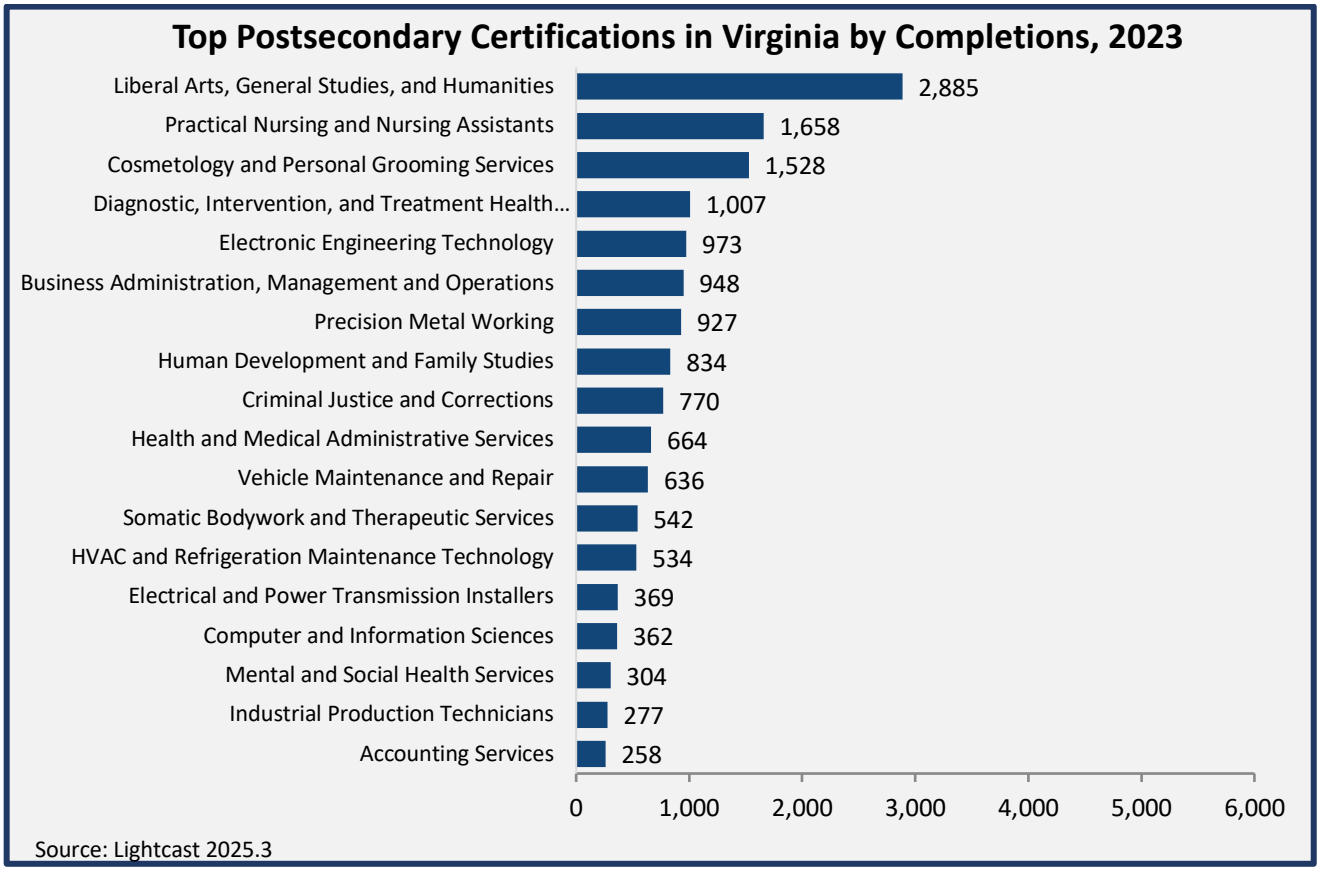
AI Offerings at Virginia 4-Year Colleges and Universities

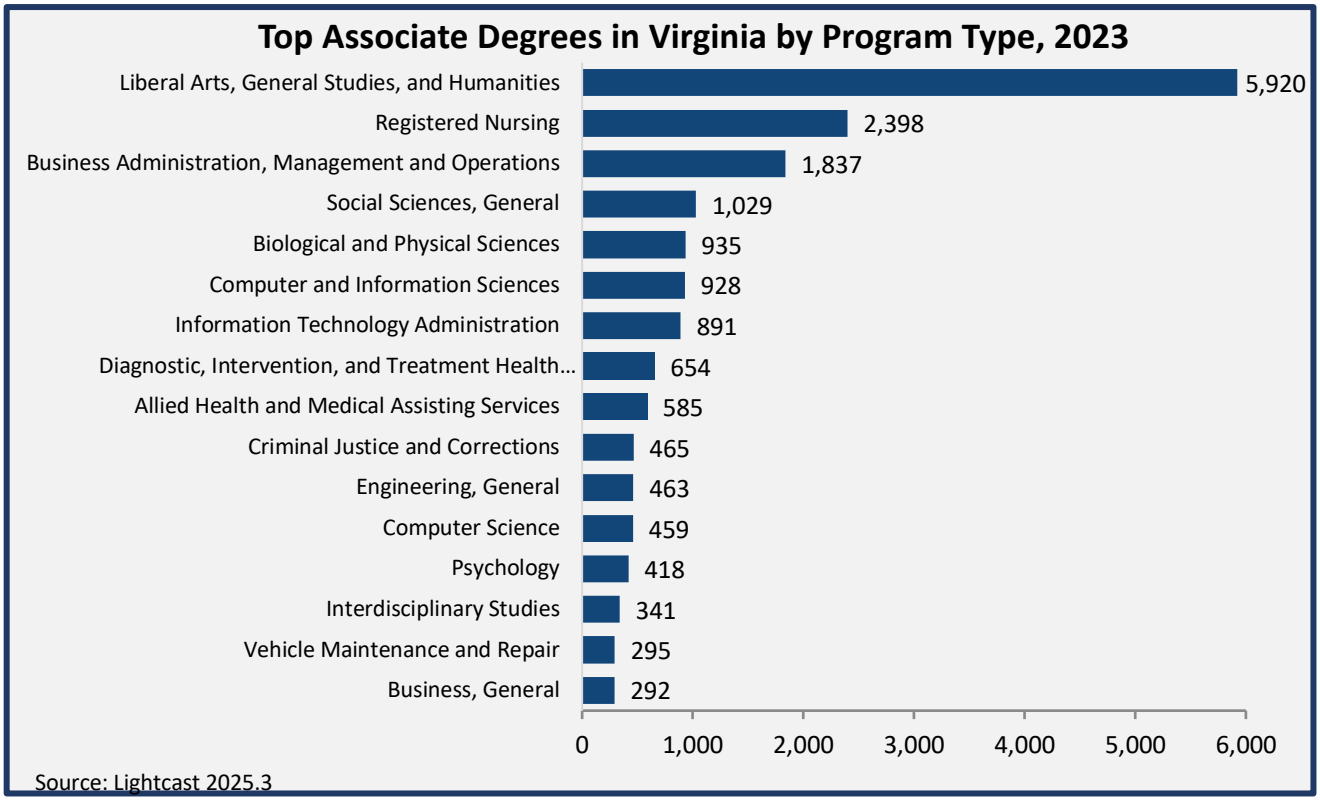
- **George Mason** offers a concentration in Artificial Intelligence as part of their Applied Computer Science BS degree and a Master of Science in Artificial Intelligence degree (first AI degree at a public university in VA) and an Artificial Intelligence in Health Graduate Certificate. Also offer a concentration in Machine Learning as part of their CS and CE Master's programs.
- **James Madison University** offers a focus in AI within their Computer Science BS program.
- **Norfolk State University's** Master of Science in Computer Engineering offers a Data Science and Machine Learning track of study as one of four optional tracks.
- **Old Dominion University** offers 5 AI Certificate programs for recent graduates or entry level data scientists.
- The **University of Virginia** offers an "AI Focal Path" of 4 courses for CS Bachelor's students interested in more information about AI and a Machine Learning "Breadth Area" as one of 6 options in their Master's and Doctoral CS degree programs. UVa is also home to the LaCrosse Institute for Ethical Artificial Intelligence in Business. Darden school of Business offers executive ed and lifelong learning as it relates to AI and business. The Darden School of Business also recently added an AI, Data Sciences and Decision Analytics concentration as an option to their MBA program.
- **Virginia Tech** is home to the Sanghani Center for Artificial Intelligence and Data Analytics. The Sanghani Center brings together 20 faculty from the Alexandria and Blacksburg campuses to apply interdisciplinary expertise to research challenges related to AI and data. They offer a Machine Learning major as part of the Bachelor of Computer Engineering program. They also offer a Data Analytics and AI concentration as part of the Master of Engineering program.
- **William & Mary** offers a concentration in AI for CS majors and an AI specialization for Data Science majors. W&M also offers a minor in AI. W&M even has a student led AI Club.
- Among private universities and colleges, **Marymount University** offers an undergraduate bachelor's degree in Artificial Intelligence as well as an AI and Robotics minor. **Hampton University** has offered an AI and ML Bachelor's degree since 2023. University of Richmond offers a 12-week AI Bootcamp as part of their professional education offerings.

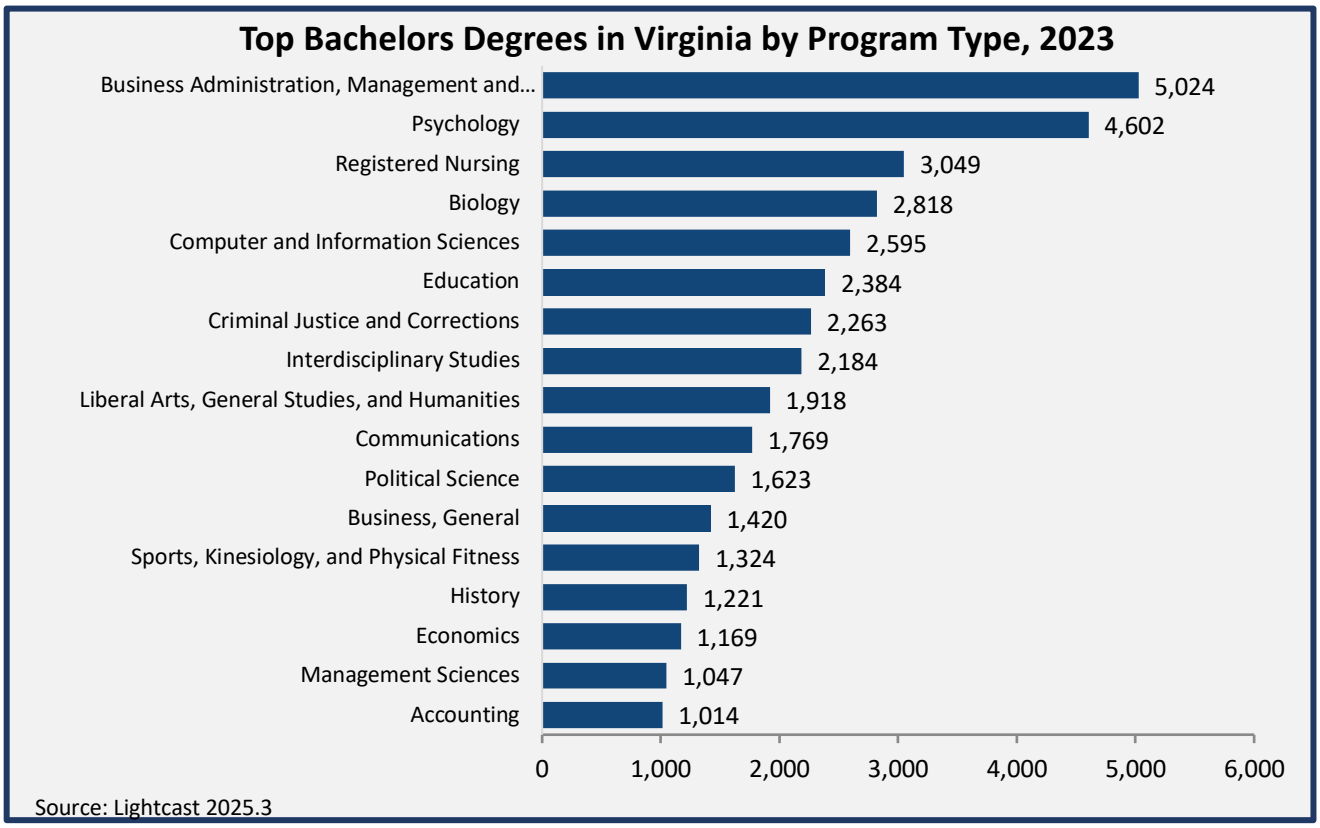


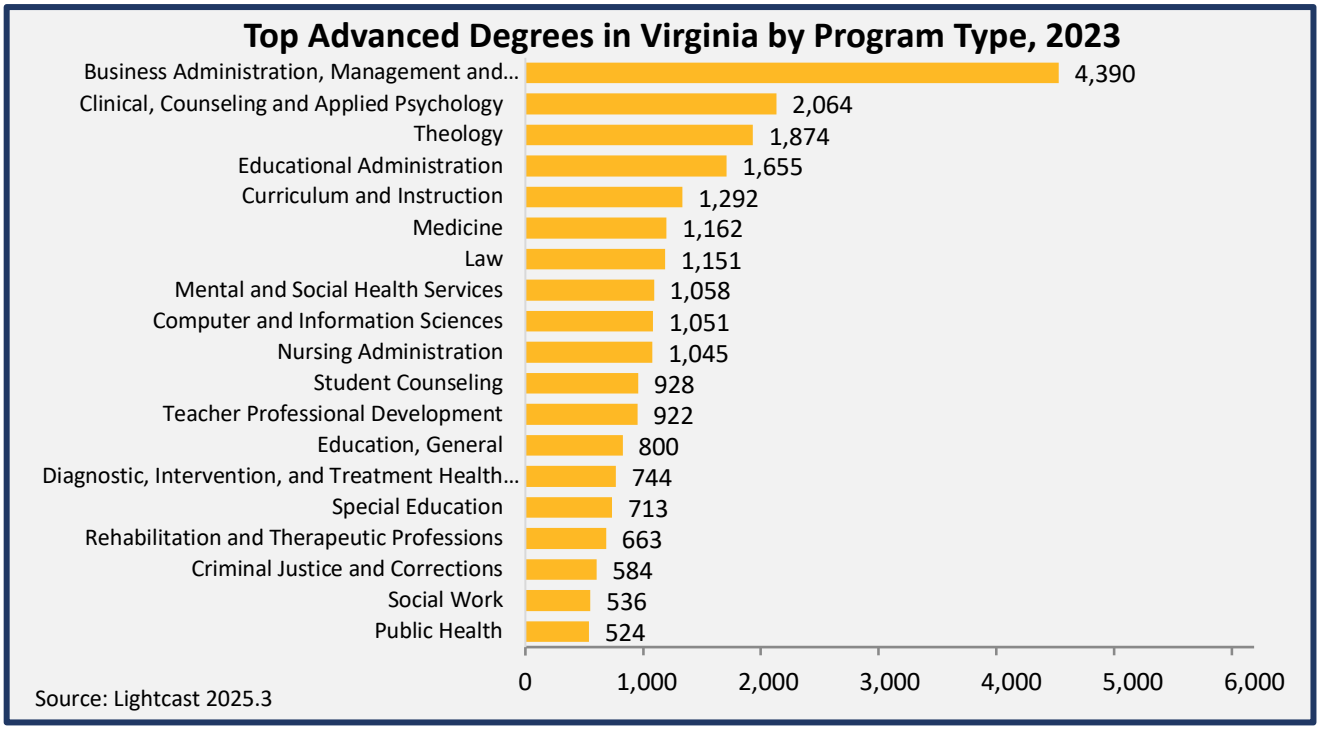
Source: Ligthcast 2025.3

Over time in Virginia the number of bachelor's and advanced degrees completed every year in the state has been rising. During this same time, the annual number of associate's degrees and certificates earned has fallen. Some of this decline could be consistent with more students pursuing higher levels of education. However, there has also been a nationwide trend of lower enrollment rates for 2-year colleges. Many of the certifications and associate's degrees conferred in the state are general studies credentials that are more helpful for advancing to 4-year schools rather than career preparation. Business and psychology programs were the most popular programs for both bachelor's and advanced degrees in Virginia for 2023.




Top Associate Degrees in Virginia by Program Type, 2023
Liberal Arts, General Studies, and Humanities 5,920
Registered Nursing 2,398
Business Administration, Management and Operations 1,837
Social Sciences, General 1,029
Biological and Physical Sciences 935
Computer and Information Sciences 928
Information Technology Administration 891
Diagnostic, Intervention, and Treatment Health... 654
Allied Health and Medical Assisting Services 585
Criminal Justice and Corrections 465
Engineering, General 463
Computer Science 459
Psychology 418
Interdisciplinary Studies 341
Vehicle Maintenance and Repair 295
Business, General 292
0 1,000 2,000 3,000 4,000 5,000 6,000
Source: Lightcast 2025.3


Top Bachelors Degrees in Virginia by Program Type, 2023
Business Administration, Management and... 5,024
Psychology 4,602
Registered Nursing 3,049
Biology 2,818
Computer and Information Sciences 2,595
Education 2,384
Criminal Justice and Corrections 2,263
Interdisciplinary Studies 2,184
Liberal Arts, General Studies, and Humanities 1,918
Communications 1,769
Political Science 1,623
Business, General 1,420
Sports, Kinesiology, and Physical Fitness 1,324
History 1,221
Economics 1,169
Management Sciences 1,047
Accounting 1,014
0 1,000 2,000 3,000 4,000 5,000 6,000
Source: Lightcast 2025.3



The following table summarizes the number of 2023 completers at Virginia colleges and universities in degree fields that are most likely to prepare graduates to work in the field of AI:

Classification of Instructional Classification	All 2023 Completions	2023 Certificate Completions	2023 Associate's Degree Completions	2023 Bachelor's Degree Completions	2023 Master's Degree Completions	2023 Doctorate Degree Completions
Computer and Information Sciences, General	4,936	408	907	2,570	968	83
Computer Programming	147	29	36	82	0	0
Data Processing	10	10	0	0	0	0
Information Science/Studies	459	10	0	389	60	0
Computer Systems Analysis	3	0	0	3	0	0
Data Entry/Microcomputer Applications	0	0	0	0	0	0
Computer Science	839	14	459	353	13	0
Computer Software and Media Applications	378	51	4	2	321	0
Computer Systems Networking and Telecommunications	39	31	2	0	6	0
Computer Engineering	593	5	0	403	166	19
Systems Engineering	196	4	0	84	80	28
Mechatronics, Robotics, and Automation Engineering	0	0	0	0	0	0
Systems Science and Theory	54	4	0	50	0	0
Data Analytics	195	140	0	2	53	0
Total All Degree Fields	**7,849**	**706**	**1,408**	**3,938**	**1,667**	**130**

The colleges and universities training the most completers in AI-related fields in 2023 were:

College or University	All 2023 Completions	2023 Certificate Completions	2023 Associate's Degree Completions	2023 Bachelor's Degree Completions	2023 Master's Degree Completions	2023 Doctorate Degree Completions
George Mason University	1,704	98	N/A	834	732	40
Virginia Tech	1,312	116	N/A	759	404	33
Northern Virginia Community College	1,055	184	871	N/A	N/A	N/A
University of Virginia	602	5	N/A	424	130	43
Virginia Commonwealth University	408	25	N/A	309	72	2
James Madison University	340	N/A	N/A	335	5	N/A
Liberty University	284	10	N/A	240	34	N/A
Old Dominion University	228	7	N/A	140	77	4

Other two-year community colleges with large numbers of certificate and associate's degree completers in AI-related fields in 2023 included: Tidewater Community College (23 certificates, 97 associate's degrees), Brightpoint Community College (22 certificates, 84 associate's degrees) and Virginia Peninsula Community College (13 certificates, 66 associate's degrees).

Virginia's AI Business-related Readiness

Much like the three state agencies that are especially critical to AI-related workforce efforts, the Virginia Economic Development Partnership (VEDP) as well as DHCD's GO Virginia initiative are playing key roles in supporting AI-related business support. VEDP is working to ensure Virginia can capitalize on its' strengths to attract and grow AI related industries. GO Virginia's diverse regional board structure helps ensure community and economic development resources are targeted to areas of great opportunity by region.

Virginia is already a leading state for technology. Known as the "data center capital of the world" Virginia is estimated to have between 600-650 data centers of various types and sizes currently operating and many more in the development pipeline. Proximity to data centers is important to reduce data latency and improve internet speed and reliability. This enhances performance for existing firms and can help drive economic development by attracting tech companies, startups, and data centers seeking robust digital infrastructure.

Another key differentiator for Virginia is its' connections to multiple undersea fiber cables. Three key undersea transmission cables connect between Virginia Beach, Europe and South America. Because of the number of data centers and the confluence of multiple transcontinental fiber lines, it has been estimated that 70 percent of the world's internet traffic flows through Virginia on a given day.

As the "data center capital of the world," Virginia is already home to many of the world's leading internet and digital firms. Additionally, many large Federal contractors are based in Virginia

predominately in the Northern Virginia and Tidewater regions of the state. Virginia's cybersecurity sector is already strong and workforce delivery systems are in place to support further growth. From a cluster development perspective, these factors have led to Virginia already having a disproportionate share of technology firms and a large technology workforce which will help grow and attract AI-related firms as well.

The I-64 Innovation Corridor's *Global Internet Hub Vision 2035* strategy that was launched in November 2025 illustrates how connecting Virginia's strengths in power generation, data storage, data transmission and cybersecurity with a well-trained workforce creates this clustering effect. The Global Internet Hub Vision 2035 report correctly states that Virginia has "the digital foundation to compete and win" on a global scale when assets are aligned and fully deployed.

In addition to large industries and employers, Virginia's economy is also driven by the more than 850,000 businesses with fewer than 250 employees located throughout the Commonwealth. Targeting training resources to help small and mid-sized businesses will need to be a key priority to ensure they are able to capitalize on AI productivity and new product development opportunities the same way large firms are beginning to benefit.

Virginia has a network of 25 Small Business Development Centers (SBDCs) that provide technical assistance, advising, training and other support to small businesses throughout the Commonwealth. Between 2020 and 2024, Virginia's SBDC's report advising more than 23,500 small businesses and had nearly 60,000 participants in their training programs. In addition to the training and advising, Virginia's SBDC has developed specialized programs for key segments of their customer base in areas such as cybersecurity, international business and craft beverages. While a few local SBDCs have offered individual AI training workshops, as of October 2025, no specialized AI programming is listed on Virginia's SBDC website.

States that have a strong foundation of technology skills and firms are seeing the opportunity to grow AI-related businesses. To be successful as a hub for AI businesses, infrastructure such as available and affordable power, building sites, targeted business incentives and robust technology workforce training programs are essential.

Data centers are required infrastructure for the growth of AI and building them involves long development timelines and they are highly capital intensive. A total data center can cost more than $300 million to develop and the equipment inside the center could approach more than $1 billion, so sales and use tax exemptions are always critical to the fiscal viability of data center projects. Even though Virginia's existing sales and use tax exemption is authorized through 2035, because of the multi-year lead time to develop data centers and the massive capital costs involved, developers may be reluctant to continue pursuing projects if the Virginia exemption is not extended soon.

Data centers – and especially AI data centers – are driving a rapid increase in energy demand in Virginia and nationally. Virginia-based data centers for cloud computing and traditional computing activities (streaming, communications) already utilize one-quarter of power utilized in the state. As AI use rapidly

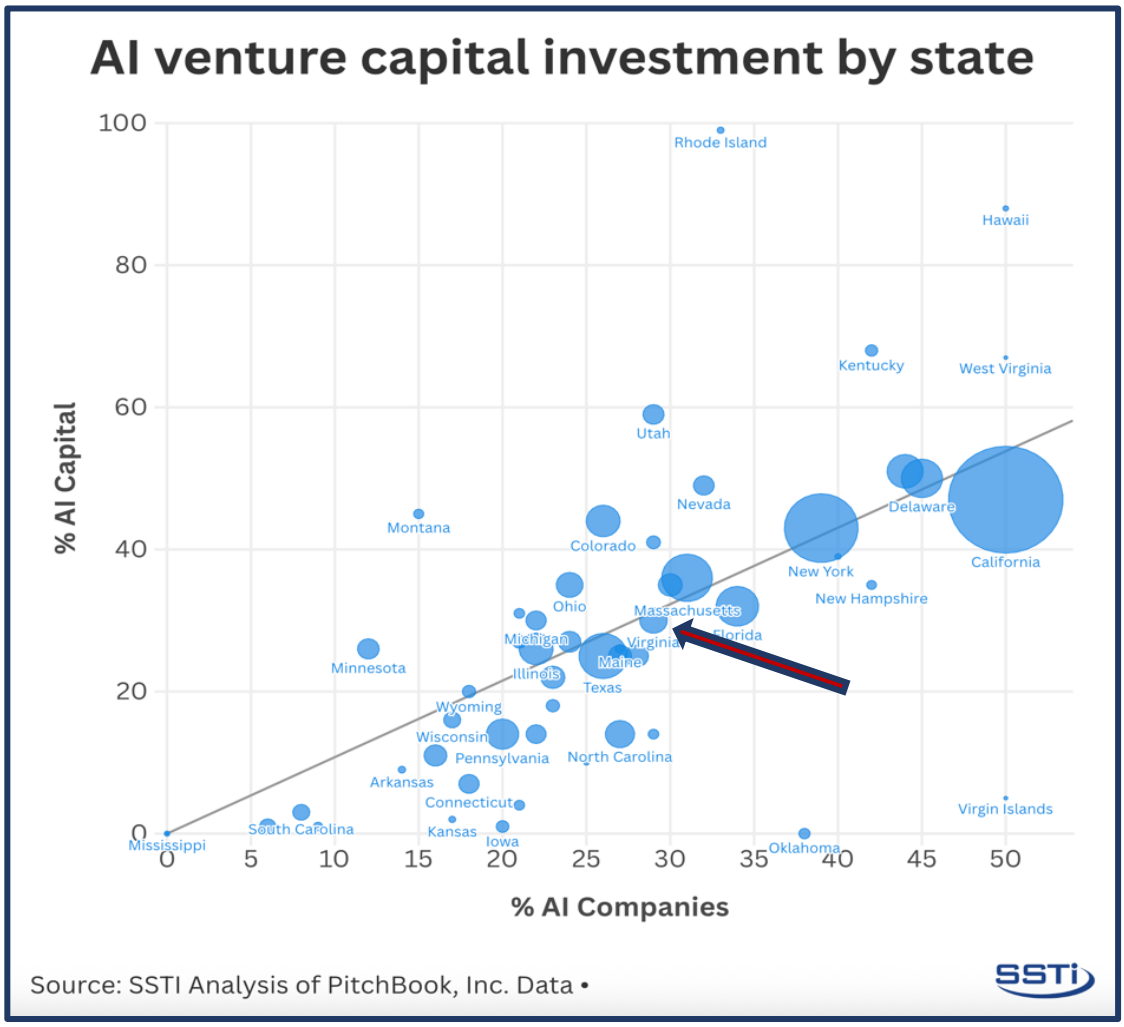
expands, additional computing capacity is needed and computing intensity will increase, resulting in significant demand for additional energy to power AI data centers. In a 2024 report on states' growing energy demand, the Electric Power Research Institute forecasts that Virginia's 2030 data center energy requirements will increase by between 31.8 percent (in a moderate growth scenario) and 165 percent (in the most aggressive high-growth forecasts) over current levels. Even under the moderate growth scenario, the share of power used by data centers is forecasted to grow to become nearly one-third of all power consumed in Virginia.

Much like the challenges facing data center developers, energy providers are also challenged to bring additional power capacity on-line due to the long lead time to get projects approved, equipment shortages, construction delays, and the complexity of energy projects. Streamlining the permitting process, approving alternative energy sources and allowing/requiring on-site energy production by data center developers are some approaches being considered and utilized across the nation to help meet growing energy demand.

The sunsetting of research and development tax credits on January 1, 2025, is a liability for Virginia in attracting AI firms conducting high levels of R&D activities. Previously, firms conducting research could claim up to a 15 percent tax credit for qualifying research activities and if the research was conducted at a Virginia institution of higher education, the level of the credit increased to 20 percent providing an additional incentive for conducting the research in state.

Incentives are a frequently used tool by states to attract and grow technology businesses. While Virginia is regularly idenfitied as one of the top states for doing business and offers a robust slate of incentives, tax credits and training funds to support the attraction and expansion of businesses overall, the business attraction/expansion tools available for smaller AI firms is quite limited. Even Virginia incentives and workforce training funding available to smaller businesses require a minimum level of capital investment and/or a required number of jobs that must be created to qualify.

Additionally, while Virginia has strong levels of venture capital investment overall, investment in AI deals in the Commonwealth has not been as strong. In SSTI's analysis of the 1,959 AI deals of under $100 million that occurred in the U.S. during the first half of 2025, they found that only 29 were investments in Virginia-based firms. As illustrated in the following chart, several other states including Nevada, New Hampshire and Kentucky had more AI-related VC deals during the first half of 2025 despite Virginia's strong technology industry base and strong tech workforce. With AI deals dominating the venture investment focus everywhere this year, such limited deal flow in the Commonwealth could indicate that Virginia's AI-related activity has been concentrated within larger firms and/or that Virginia has a limited number of investment-ready, early-stage AI firms.


AI venture capital investment by state
% AI Capital
% AI Companies
100
80
60
40
20
0
0
5
10
15
20
25
30
35
40
45
50
Rhode Island
Hawaii
Kentucky
West Virginia
Utah
Nevada
Delaware
Montana
Colorado
California
New York
New Hampshire
Ohio
Massachusetts
Florida
Michigan
Virginia
Minnesota
Maine
Illinois
Texas
Wyoming
Wisconsin
Pennsylvania
North Carolina
Arkansas
Connecticut
Virgin Islands
South Carolina
Kansas
Iowa
Mississippi
Oklahoma
Source: SSTI Analysis of PitchBook, Inc. Data •
SSTi

Section 4 – Forecasting AI impacts in the Commonwealth

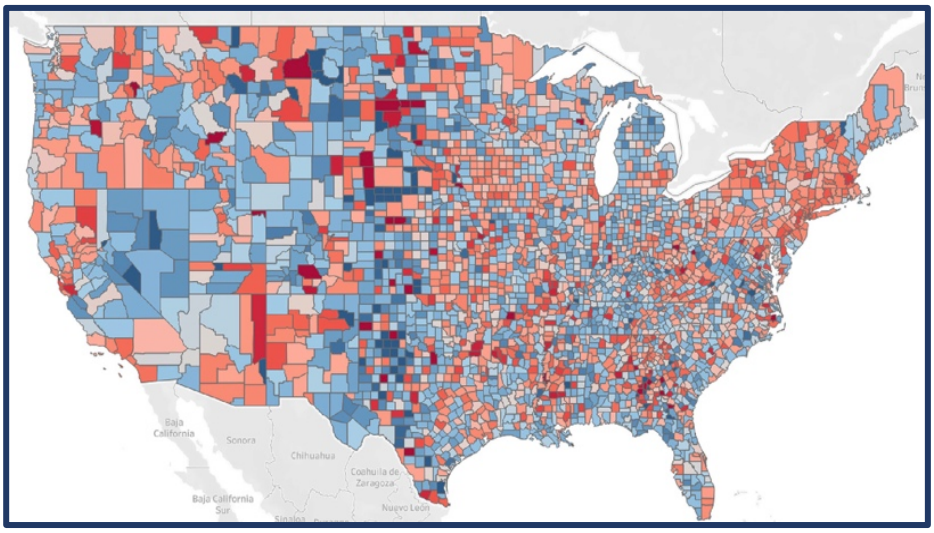
In addition to understanding the existing landscape and current opinions about AI in Virginia, this project also reviewed existing literature on geographic impacts of AI and created new forecasts of potential impacts on the workforce and workplaces in Virginia.

Forecasting AI Impacts on Virginia

- Virginia is projected to be one of the top 5-10 states in the number of jobs "exposed" or "highly exposed" to impacts of AI
- As many as 1.5 million jobs could be impacted in some way by AI-related changes in the Commonwealth
- AI's impact is most likely to be felt in larger and more densely populated metro areas as well as in areas with higher education attainment levels
  - AI related impacts are projected to range from 29 percent of jobs in GO Virginia's Region 3 to 39 percent of jobs in GO Virginia's Region 7
- A U.S. Treasury study that looked at AI occupational impacts by micro areas found that north Arlington County had the 3rd highest share of jobs exposed to GenAI in the nation

Several existing studies have attempted to forecast the impact of AI in Virginia and other states. Consistent among these studies, Virginia's occupations and industries are forecasted to be impacted more than most states due to the concentration of jobs and industries potentially subject to automation and augmentation due to AI.

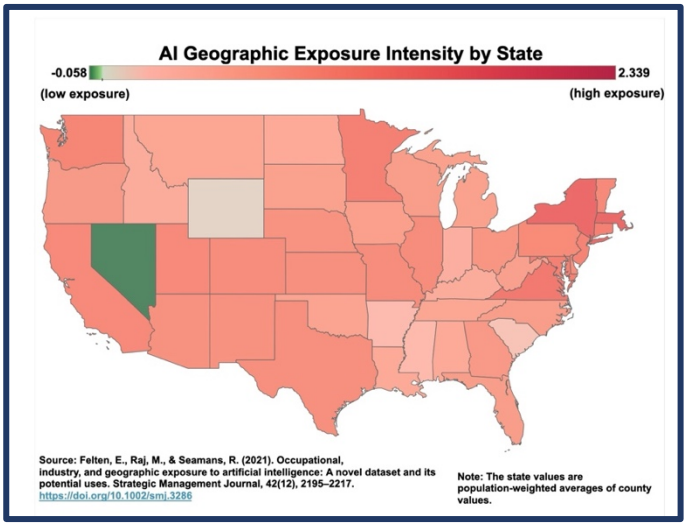
In a foundational research paper on AI's potential impacts entitled "Occupational, industry, and geographic exposure to artificial intelligence", authors Felten, Raj and Seamans established some of the methodology used by many other researchers to calculate the impact of AI on various occupations and industries. The paper also included a methodology for measuring AI's impact by industry and by geography. The AI Geographic Exposure (AIGE) measure considers the concentration of jobs by county that are likely to be "impacted" by AI and created a map showing counties of highest potential impact in dark red. Counties in the AIGE map least likely to be impacted are in dark blue. As the above



Source: Felten, Raj and Seamans, "Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its' potential uses", 2021.

map illustrates, several counties in Northern Virginia, the Tidewaters area and in central Virginia appear in shades of red with Northern Virginia counties appearing in dark red.

Researchers at Heartland Forward used the county-by-county methodology developed by Felten, Raj and Seamans to calculate exposure levels by state. In Heartland Forward's calculations, Virginia is among the five states with the highest projected level of exposure to AI-related job impacts.



A U.S. Department of Treasury's Office of Economic Policy Report published in 2024 also found that Virginia has a high share of occupations potentially exposed to AI impacts. The following chart from that report ranks Virginia as having the 8th highest level of exposure among all states and the District of Columbia.

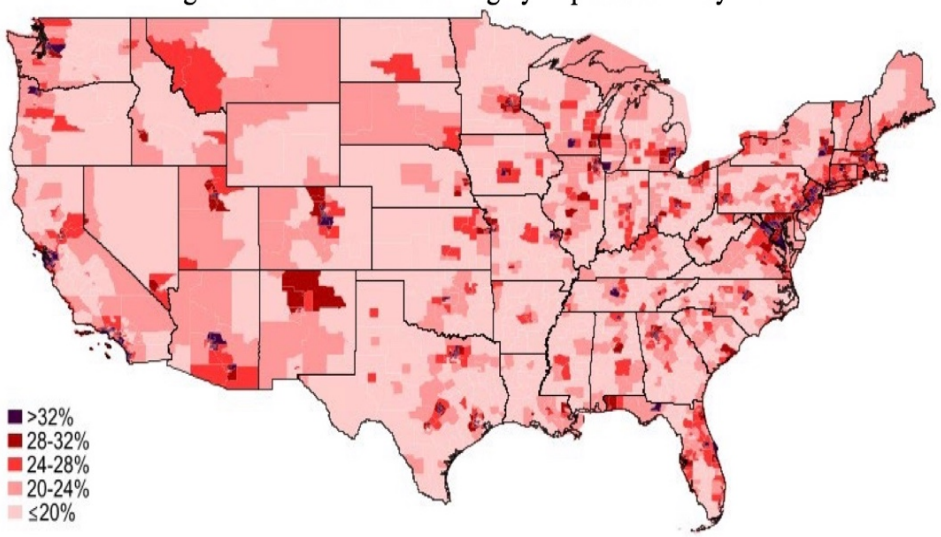
Table B.1 Share of Employment Highly Exposed to AI by States, Ranked

Rank	State Name	Highly Exposed Share	Rank	State Name	Highly Exposed Share	Rank	State Name	Highly Exposed Share
1	District Of Columbia	39.8	18	Alaska	25.3	35	Oklahoma	23.2
2	Maryland	29.5	19	Michigan	25.1	36	Montana	23.1
3	Utah	28.1	20	Delaware	25.1	37	Iowa	23.0
4	Colorado	27.6	21	New Hampshire	25.1	38	Tennessee	22.9
5	New Jersey	27.5	22	Pennsylvania	25.0	39	Vermont	22.9
6	Arizona	27.4	23	New Mexico	24.8	40	Alabama	22.8
7	Massachusetts	27.3	24	Georgia	24.6	41	Indiana	22.7
8	Virginia	27.2	25	Missouri	24.5	42	South Carolina	22.6
9	Connecticut	26.5	26	Texas	24.4	43	Nevada	22.3
10	New York	26.3	27	Idaho	24.3	44	Kentucky	22.2
11	California	26.0	28	Wisconsin	24.3	45	Louisiana	22.2
12	Washington	25.7	29	Ohio	24.2	46	South Dakota	22.1
13	Minnesota	25.7	30	Nebraska	23.9	47	West Virginia	21.3
14	Illinois	25.6	31	Kansas	23.9	48	Arkansas	20.9
15	Florida	25.5	32	Hawaii	23.8	49	North Dakota	20.7
16	Oregon	25.5	33	North Carolina	23.6	50	Wyoming	20.1
17	Rhode Island	25.4	34	Maine	23.4	51	Mississippi	19.5

Source: Schendstok and Wertz, U.S. Department of Treasury, Office of Economic Policy, "Occupational Exposure to Artificial Intelligence by Geography and Education", 2024.

The Treasury Department report also calculated forecasted impact of AI by Public Use Micro Area (PUMAs). PUMAs are defined by the U.S. Census Bureau as "non-overlapping, statistical geographic areas that partition each state or equivalent entity into geographic areas containing no fewer than 100,000 people each." There are 2,350 PUMAs in total and they are used for tabulation and reporting of U.S. Census data, American Community Survey data and other Federal reports. The report includes the following map illustrating the PUMAs with the highest levels of jobs exposed to AI impacts.

Figure 1: Share of Workers Highly Exposed to AI by PUMA



Source: O*NET, American Community Survey (2021 5-Year ACS), and Kochhar (2023). Highest exposure to AI based on quartile of workers nationally most exposed to AI based on their occupation. Map categories approximately reflect the 25th, 50th, 75th, and 90th percentile cutoffs.

Source: Schendstok and Wertz, U.S. Department of Treasury, Office of Economic Policy, "Occupational Exposure to Artificial Intelligence by Geography and Education", 2024.

While several national studies already indicate that Virginia is among the states likely to experience the highest levels of AI-related impacts on jobs and industries as use of the technology increases, to formulate Virginia-specific recommendations, it is also important to forecast the potential impact on specific occupations, industries and regions across the Commonwealth. The following sections include forecasts formulated as part of this study to help policy makers and leaders best prepare for potential AI impacts.

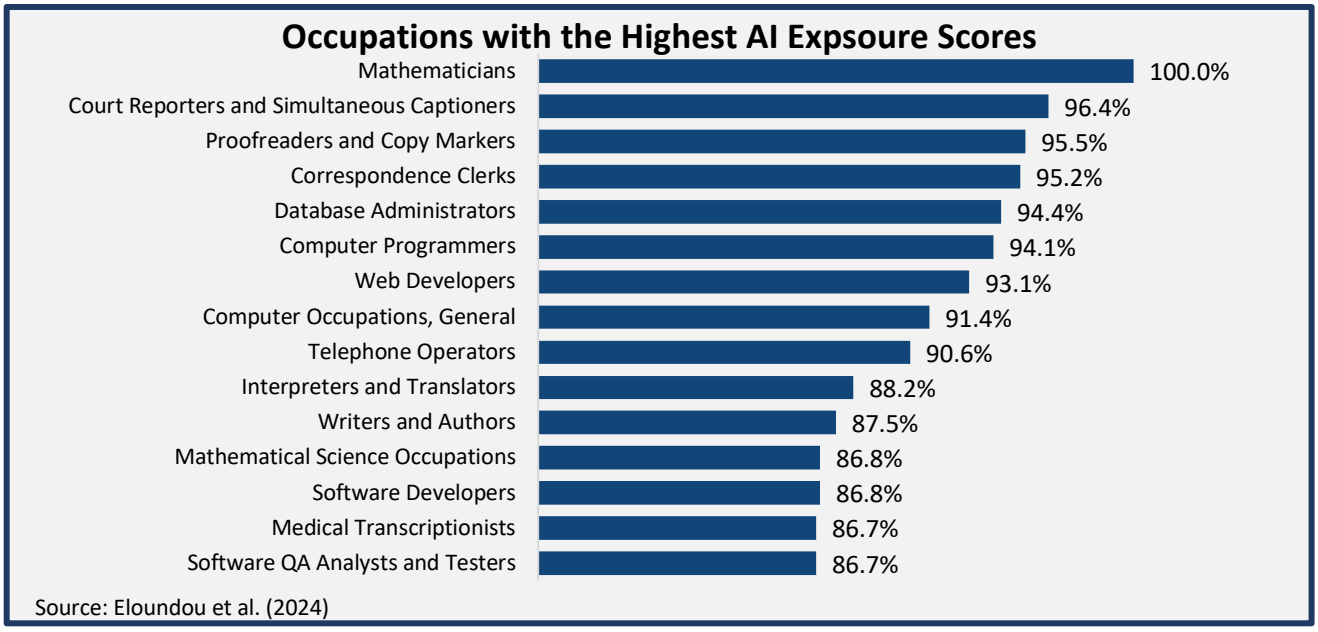
Occupations and AI Exposure

The other side of the AI discussion is how this technology could affect demand and employment in roles across the economy. Economic Leadership (EL) reviewed the recent research papers that attempt to show which occupations could be most impacted. Most of these studies looked at the type of skills of an occupation and compared these with the type of skills that LLMs and similar forms of AI are augmenting or automating. Most papers' explanation of these impacts referred to it as AI-related "exposure." This terminology is meant to measure the impact of the technology but not predict whether jobs would be replaced by these tools.

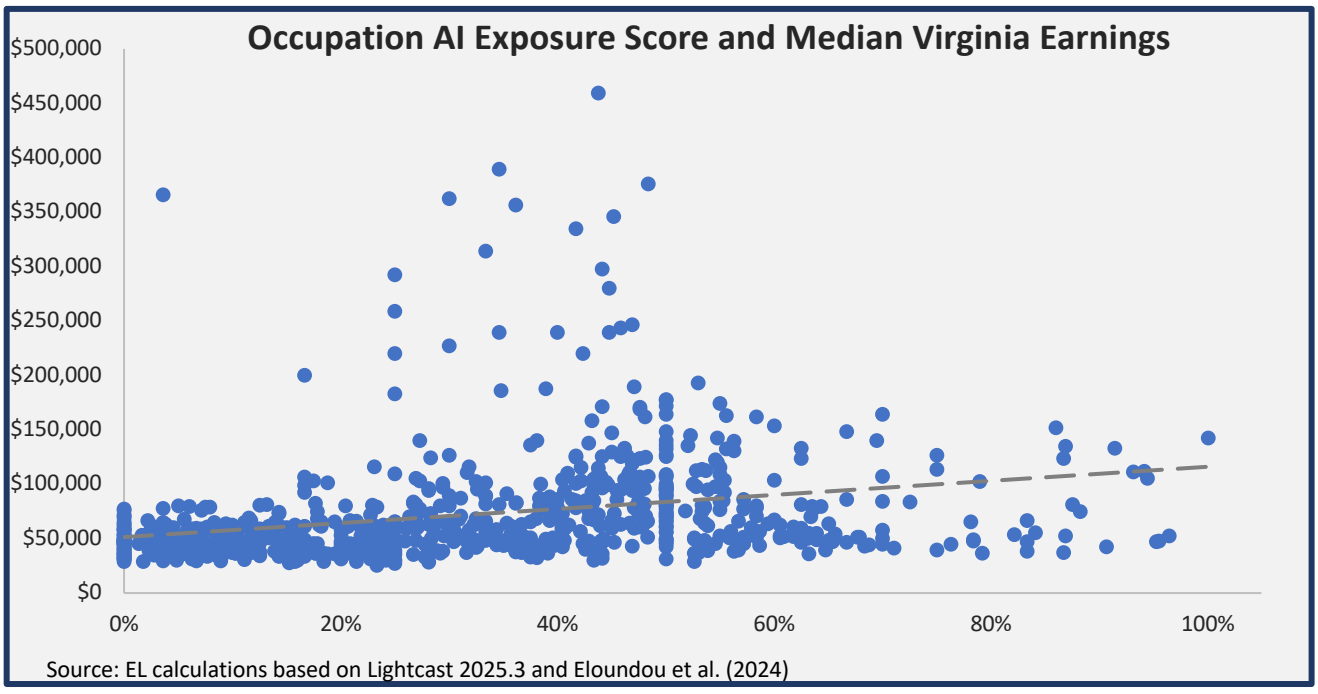
One paper appeared to the be the gold standard that was referenced in most of the subsequent papers. In the seminal *"GPTs are GPTs"* study, Eloundou et al. (2024) estimated the specific percentage of tasks conducted by each occupation that are exposed to LLM software. Exposure was defined as a 50 percent reduction in the time it takes to complete a task (GPT Beta Score). This report provided EL with a

framework of exposure for each occupation in the economy which could then be applied to Virginia to better understand potential AI impacts.

The exposure scores highlight the types of jobs with the highest potential for augmentation or automation of tasks from AI. Computer programmers, web developers, writers, and mathematicians are among the most exposed occupations.



When AI exposure scores are mapped against the median annual earnings for occupations in Virginia, there is significant variation, but a positive correlation emerges between the jobs with higher AI exposure levels and higher wages.



Some occupations had an exposure score of zero, these included several trade, construction, and extraction occupations.

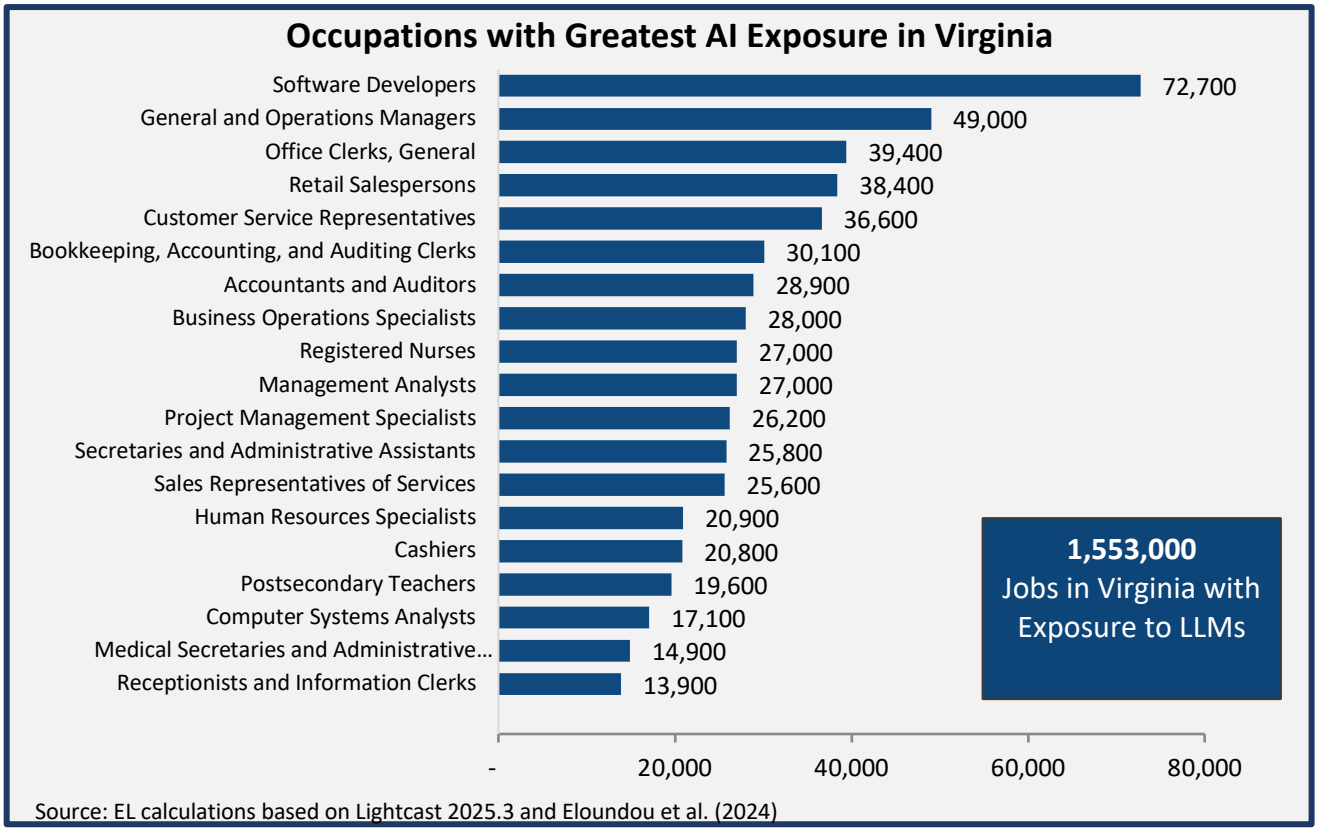
Occupations with No AI Exposure

Occupation
Stonemasons
Painting, Coating, and Decorating Workers
Tire Repairers and Changers
Wellhead Pumpers
Packaging and Filling Machine Operators and Tenders
Pile Driver Operators
Motorboat Operators
Motorcycle Mechanics
Hoist and Winch Operators
Agricultural Equipment Operators
Athletes and Sports Competitors
Electrical Power-Line Installers and Repairers

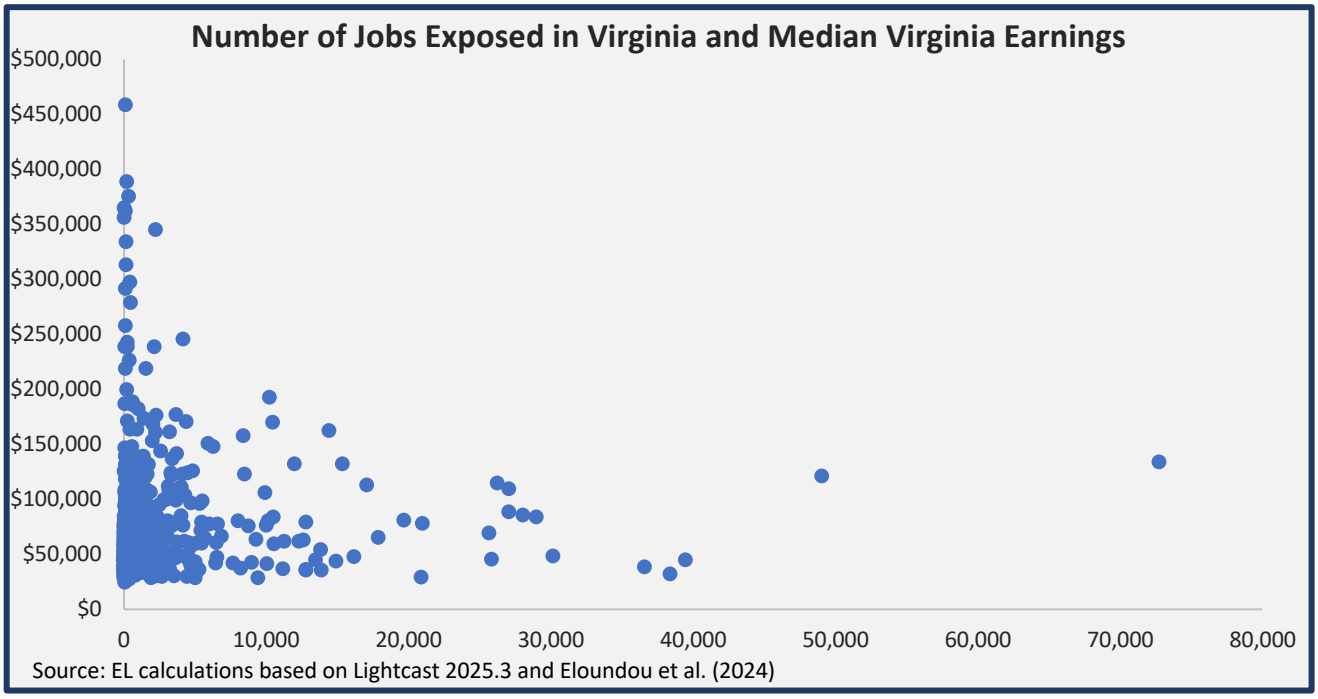
Source: Eloundou et al. (2024)

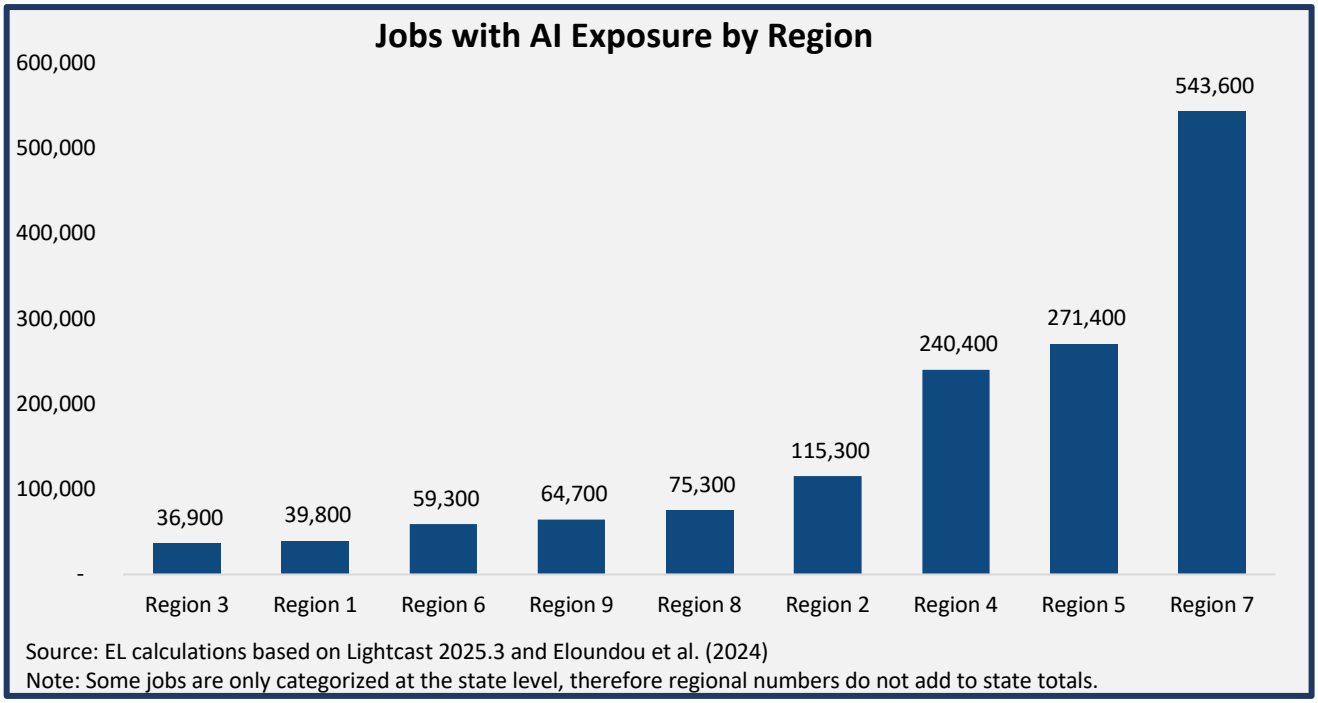
Exposure scores to LLM technology were applied to Virginia's labor market data from 2024 to understand the number of jobs that could heavily utilize AI. Given the exposure score amounted to the percentage of tasks affected, these exposure scores were applied to employment data assuming this was equivalent to the percentage of jobs that would be exposed to AI.

Based on the 2024 employment levels in the state, about 1.55 million jobs in the state can be predicted to be exposed to LLM technology. While mathematicians have the top exposure score, they make up a small portion of the Virginia economy, therefore it is not a top impacted occupation. Exposed job numbers were rounded to the nearest one hundred to emphasize that these values are broad assessments rather than precise measurements. Among the top occupations are software developers, customer service representatives, and clerical workers. In all, over 35 percent of all jobs in Virginia could be exposed to AI.

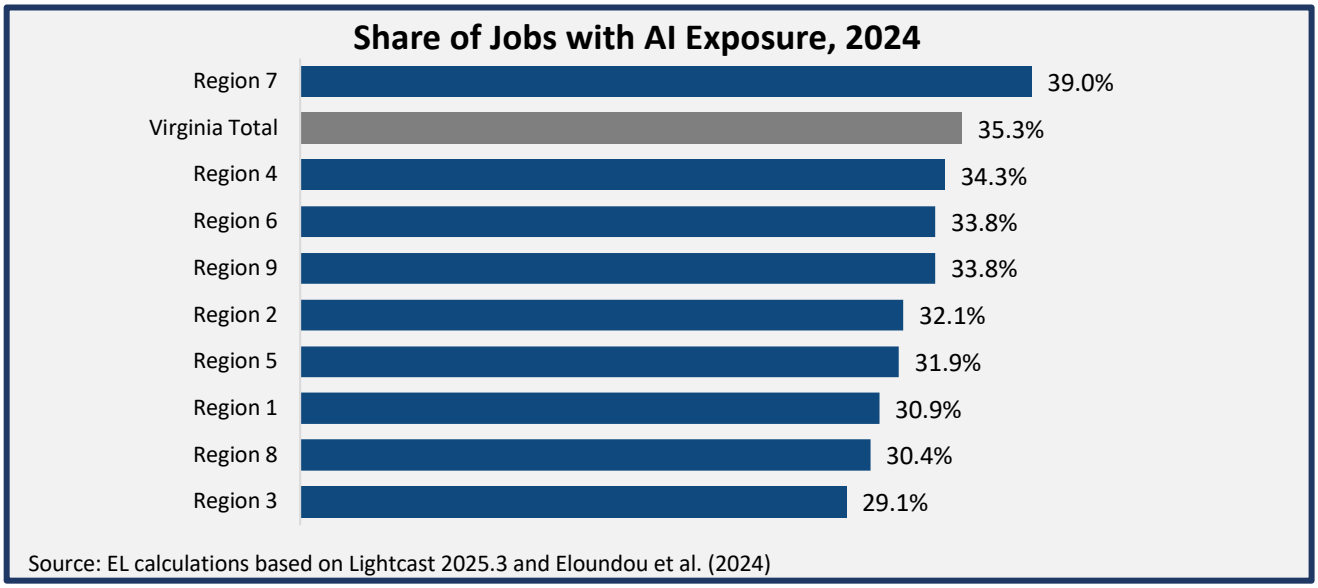


Outside of these top occupations, the number of exposed jobs in other occupations is not as significant. The occupational mix varies within each region of Virginia, therefore the number of jobs exposed varies from 36,900 in Region 3 to over half a million (543,600) in Region 7. Given the largest concentration of knowledge work in Northern Virginia, the region is likely to be the most impacted in the state by AI. A forecast of potential AI-related impacts by GO Virginia region appears in Appendix B of this report.

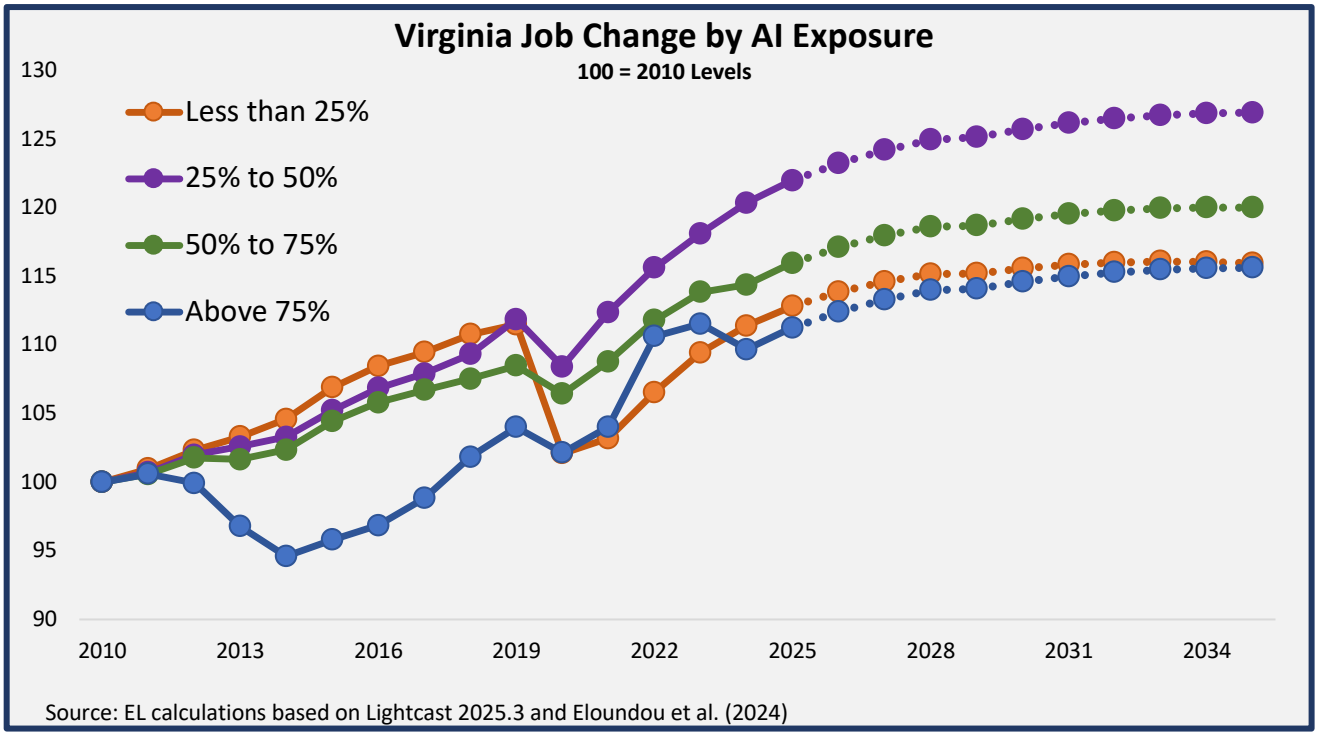




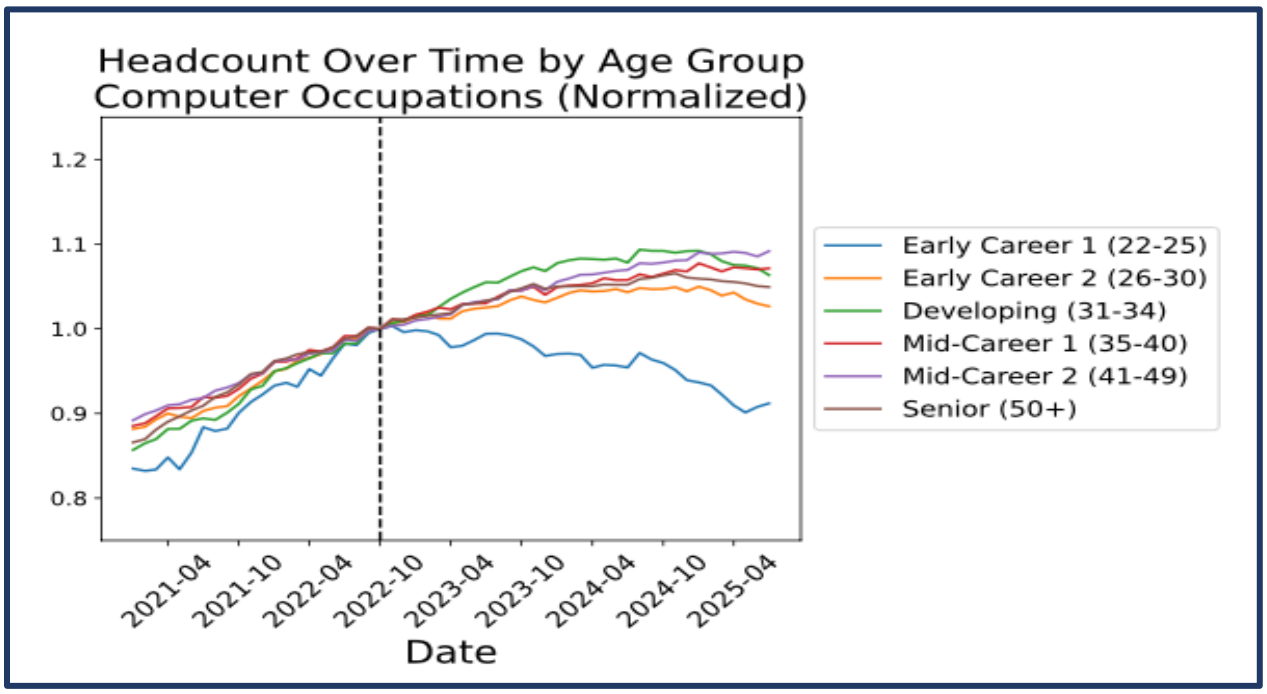
The share of exposed jobs compared to the regional total also varies within the state. For example, Region 8 has the 5th highest employment exposure with 75,300 jobs. However, this only accounts for 30 percent of all the jobs in the region. Making Region 8 the 8th highest in terms of AI exposed jobs share. The high number of exposed jobs in Region 7 raises the exposure share of the whole state, while every other region in the state has lower exposure shares.



Occupation employment trends were then grouped by their occupation scores. In Virginia, the jobs with the highest exposure to AI tools (75 percent and above) are predicted to the have the lowest growth rates. This group saw its post pandemic growth trajectory turn after 2022 and even decline in 2024. Interestingly, the jobs in the state with the lowest exposure are also not predicted to do as well as those with medium levels of exposure.

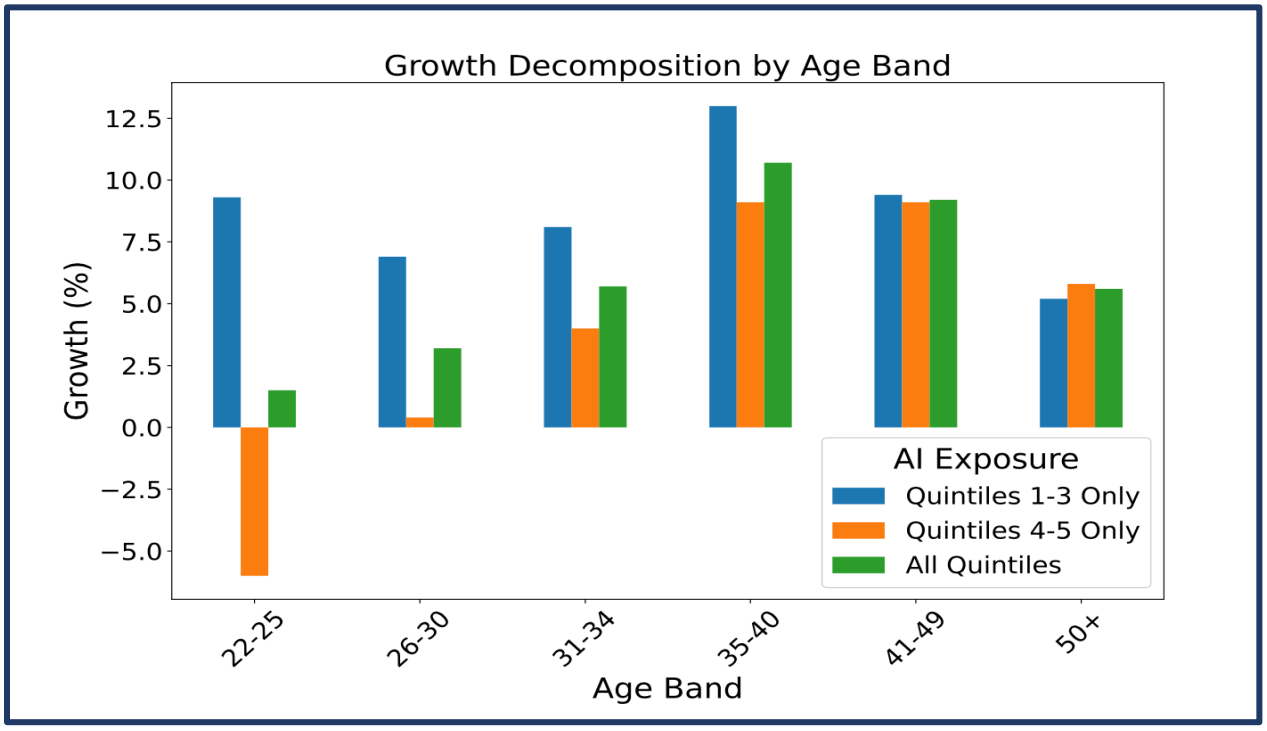


While the long-term impacts of AI on highly exposed jobs remain uncertain, recent data suggest that early-career workers, including recent graduates, may already be experiencing reduced opportunities. In the paper *"Canaries in the Coal Mine: Six Facts about the Recent Employment Effects of Artificial Intelligence,"* Stanford researchers found evidence that employment levels for younger workers have declined since the introduction of LLMs. This report also utilizes the GPT Beta exposure score from the Eloundou et al. paper. Exposure scores were compared against recent national payroll data from ADP. Their research found that in the highest exposed occupations there has been a shift in early career headcounts since the onset of ChatGPT and other LLM tools. These findings remained consistent even when researchers accounted for alternative explanations, such as remote work, Federal Reserve interest rate hikes, and the impacts of the COVID-19 pandemic on higher education.



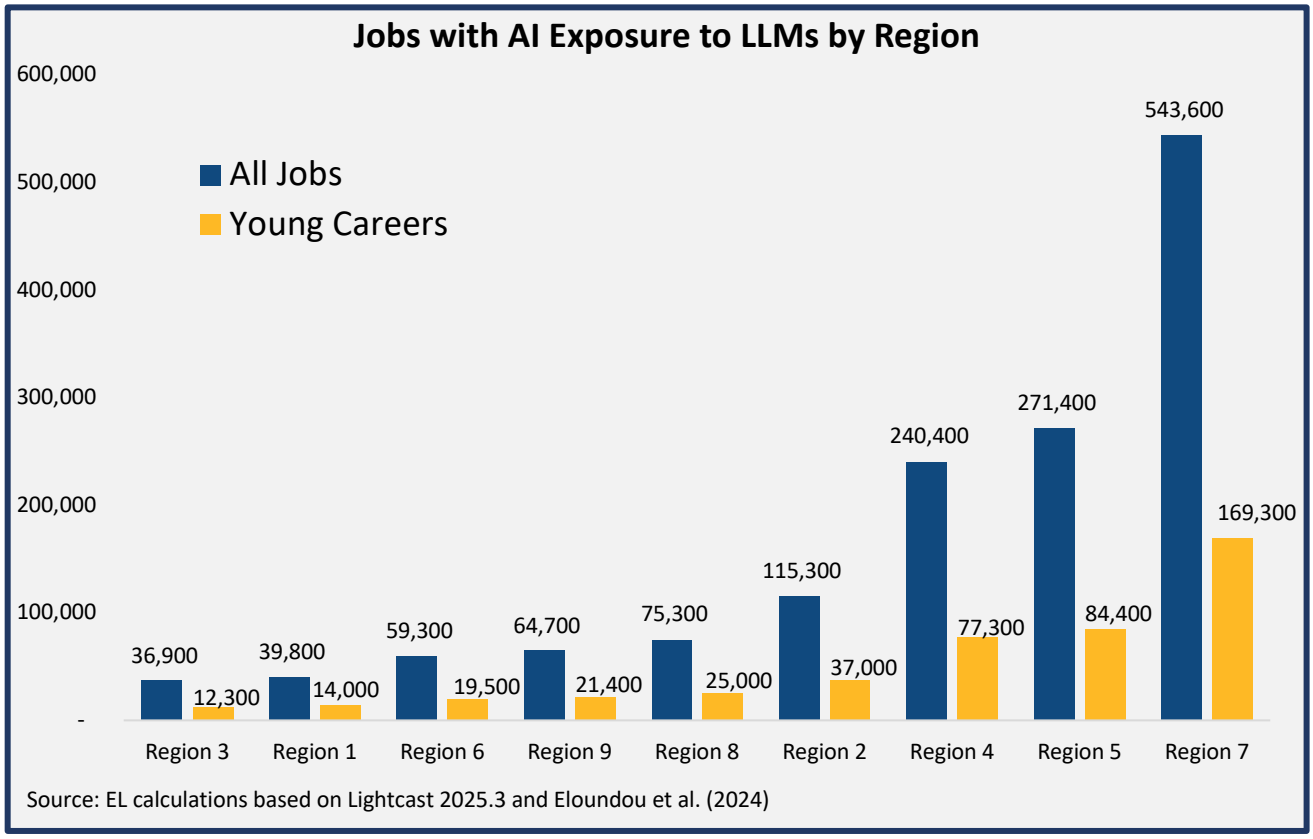
Source: Brynjolfsson et al. (2025)

The reduction in early-career employment has been most pronounced for occupations with the highest AI exposure scores (quintiles 4–5). Meanwhile employment levels continue to rise for older workers in these highly exposed occupations. Challenges for recent graduates in securing knowledge-based employment has also been highlighted anecdotally in several media reports.



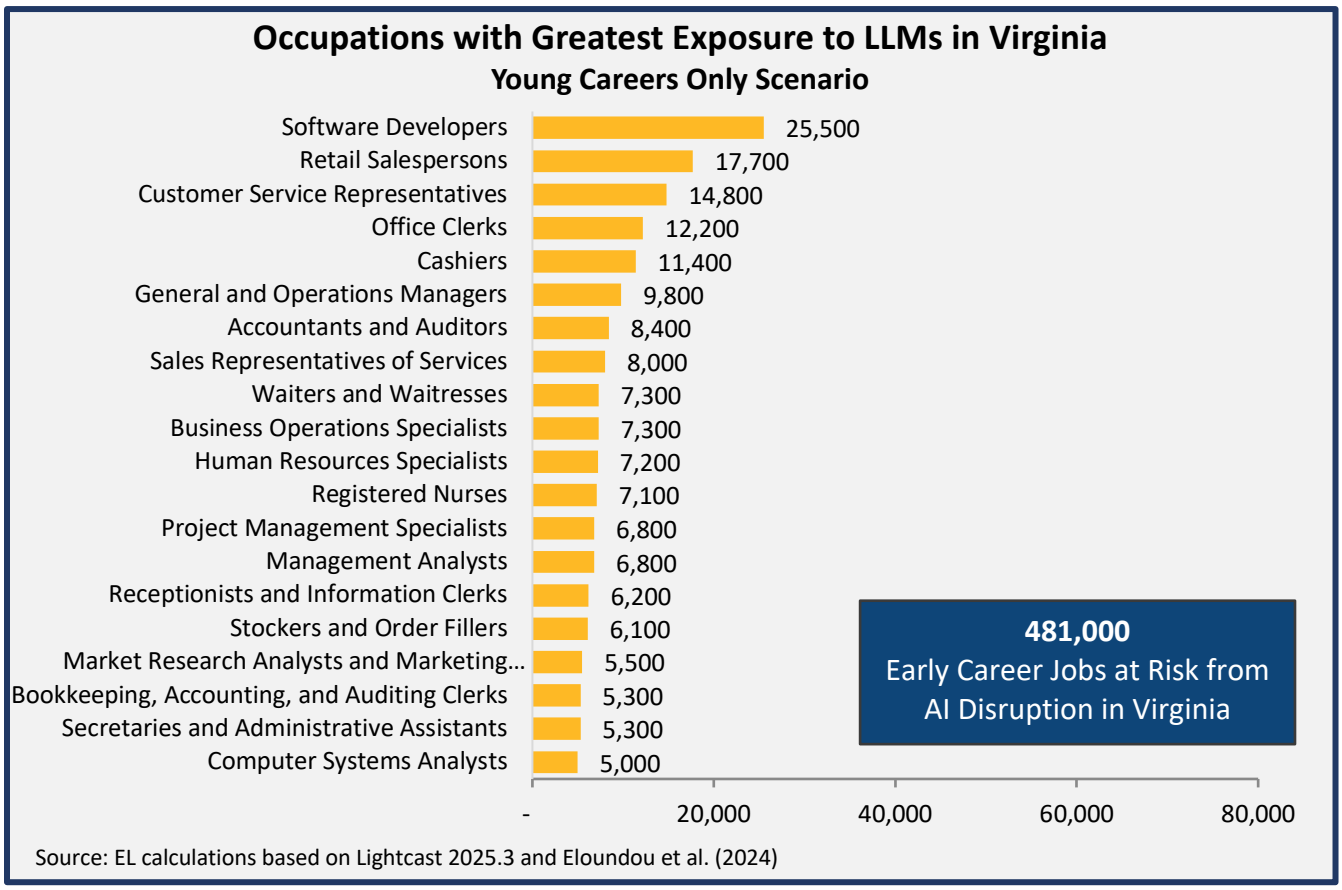
Source: Brynjolfsson et al. (2025)

This research suggests that primarily younger workers are experiencing job impacts due to AI. EL decided that based on this research, a reasonable lower bound of exposure could be measured by only applying AI exposure to young workers. To produce this lower bound of potential exposure in Virginia's economy, occupation data was shifted from all ages to just the workers in the occupation who were age 14 to 35. This age range is the closest match to the Brynjolfsson et al. age brackets that is achievable with labor market data. This creates a lower impact scenario where only jobs for younger workers would be impacted by AI exposure.

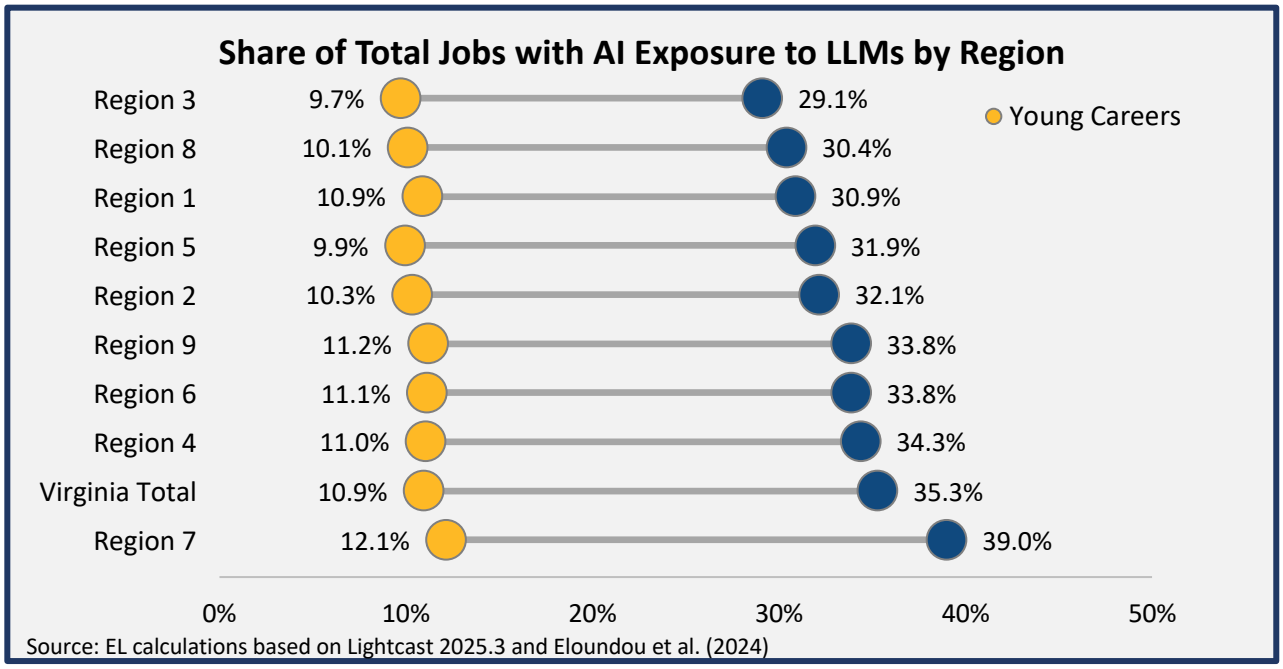


Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

If AI will only augment or automate early career tasks, then the potential exposure for Virginia will be much smaller at about 481,000 jobs. This amounts to about 11 percent of all jobs in the state. Since younger people are more likely to be employed in certain types of positions, some occupations like retail salespersons and cashiers have higher numbers of exposed jobs in the young career scenario. Many young people took on college debt to be trained for positions in software development, nursing, and business operations. If AI exposure in these jobs does lead to fewer job opportunities, then these young workers will have a difficult time repositioning their careers and developing economic security.



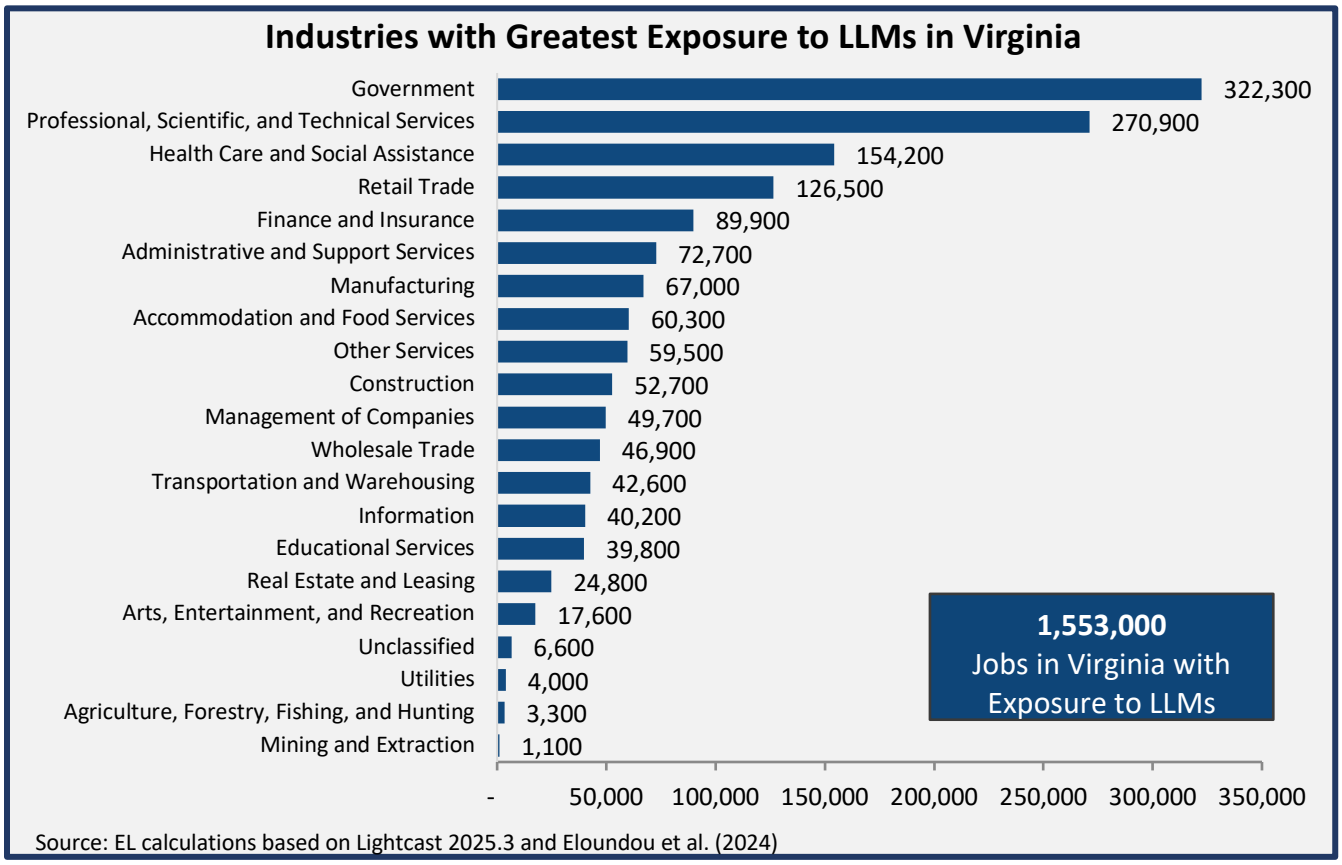
The share of young careers exposed to AI varies from 9.7 percent in Region 3 to 12.1 percent in Region 7. This young career scenario creates a range where the level of jobs impacted is estimated to be somewhere between one-tenth or one-third of all jobs in the state.



Industry Impacts

The occupational impacts can be cross walked to their employing industries to understand the industry's most likely to be impacted by AI. By combining industry staffing patterns with the occupational exposure scores, the exposure level of each industry in Virginia was identified. The government sector is the industry with the largest number of jobs with AI exposure. Government includes state and local education. Teaching occupations have high levels of employment in the industry and medium to high AI exposure scores. The other portions of the government industry include agencies that employ large number of clerical and secretarial workers that also tend to have higher AI exposure scores.

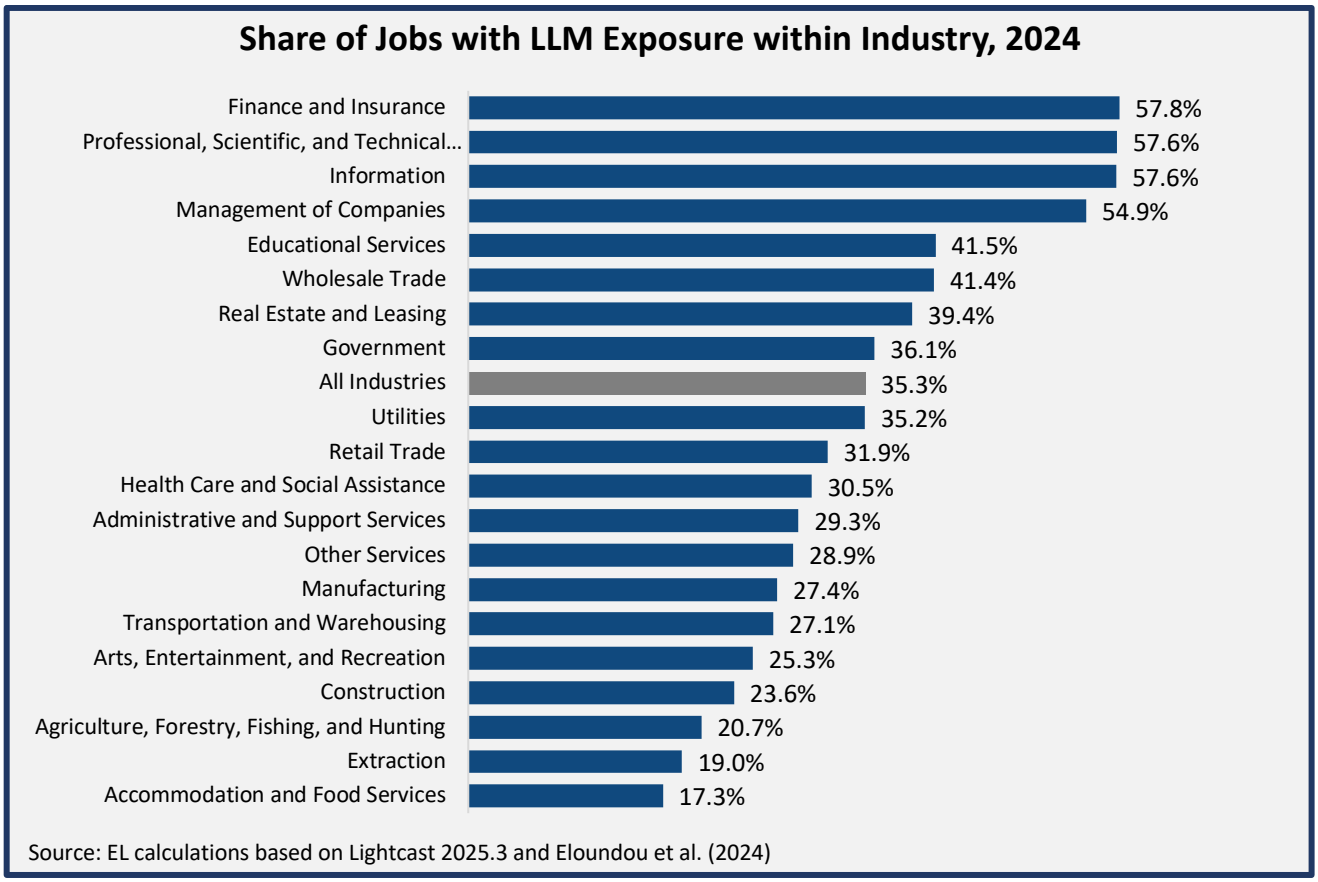
The next most impacted industry is professional, scientific, and technical services. This sector employs many of the knowledge work occupations that are most associated with AI exposure today such as software developers, analysts, and data scientists. It also includes jobs like lawyers and legal assistants who spend a large part of their job reading, researching, and writing. These first two industries are responsible for almost 40 percent of all the AI exposure in Virginia's economy. Healthcare is the 3rd most exposed industry. This is largely due to the large number of administrative workers who support the healthcare providers. AI does also appear to have potential in automating some of the first line questioning and intake of patients. These types of tasks represent the type of AI implementation that is expected to maintain significant human oversight over the technology.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

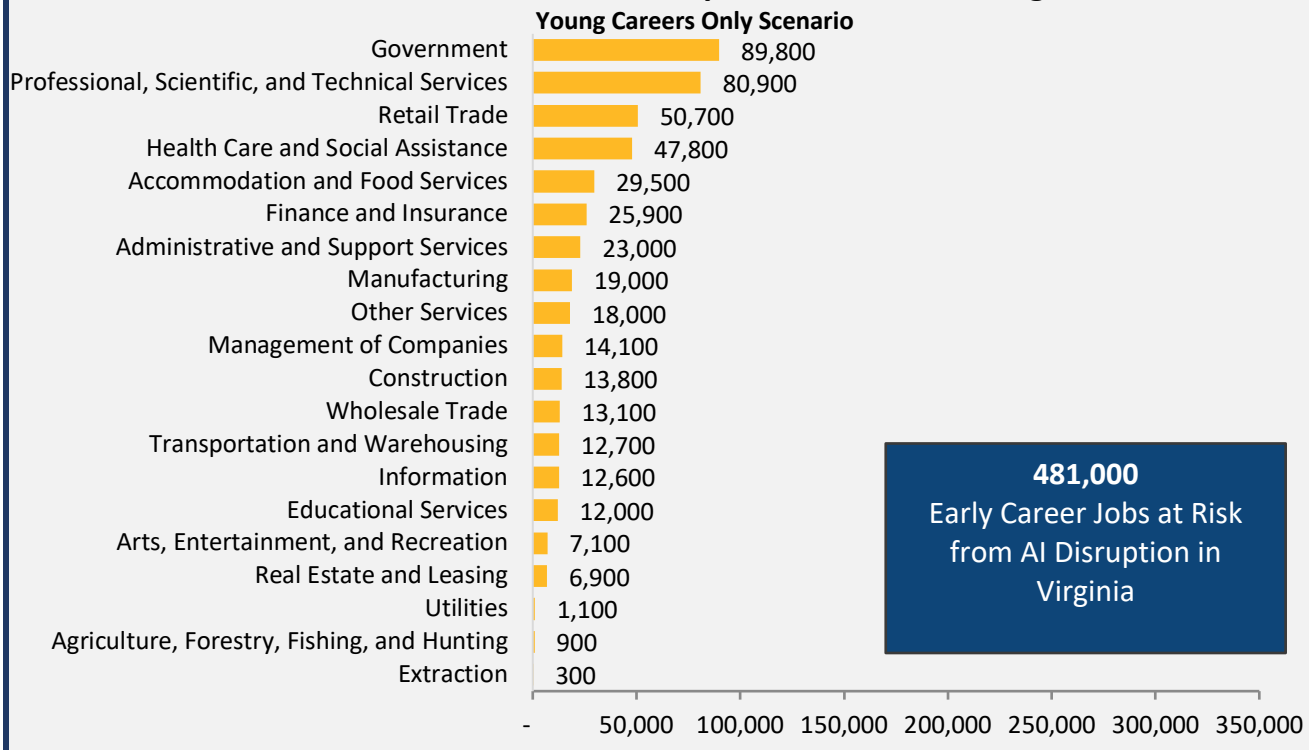
When comparing the AI exposed jobs to the total jobs within the industry, finance and insurance has the highest share of exposure at almost 58 percent. Other top employers of knowledge workers like professional services, information, and management all have an exposure share of over half of their workforce. For some industries, their share is much lower. The construction industry, for example, only has about 24 percent of its headcount exposed to AI technology.

The same methodology was applied to just the young workers in each industry to determine the potential exposure if only young careers are impacted. Under the young career scenario, government and professional services remain the top AI exposed industries. Retail and accommodation and food services are among the most impacted industries due to employing more young people in high exposure occupations. The greatest share of young career impact is estimated in the information industry at 18 percent of the total workforce. This industry includes social media companies alongside traditional media.



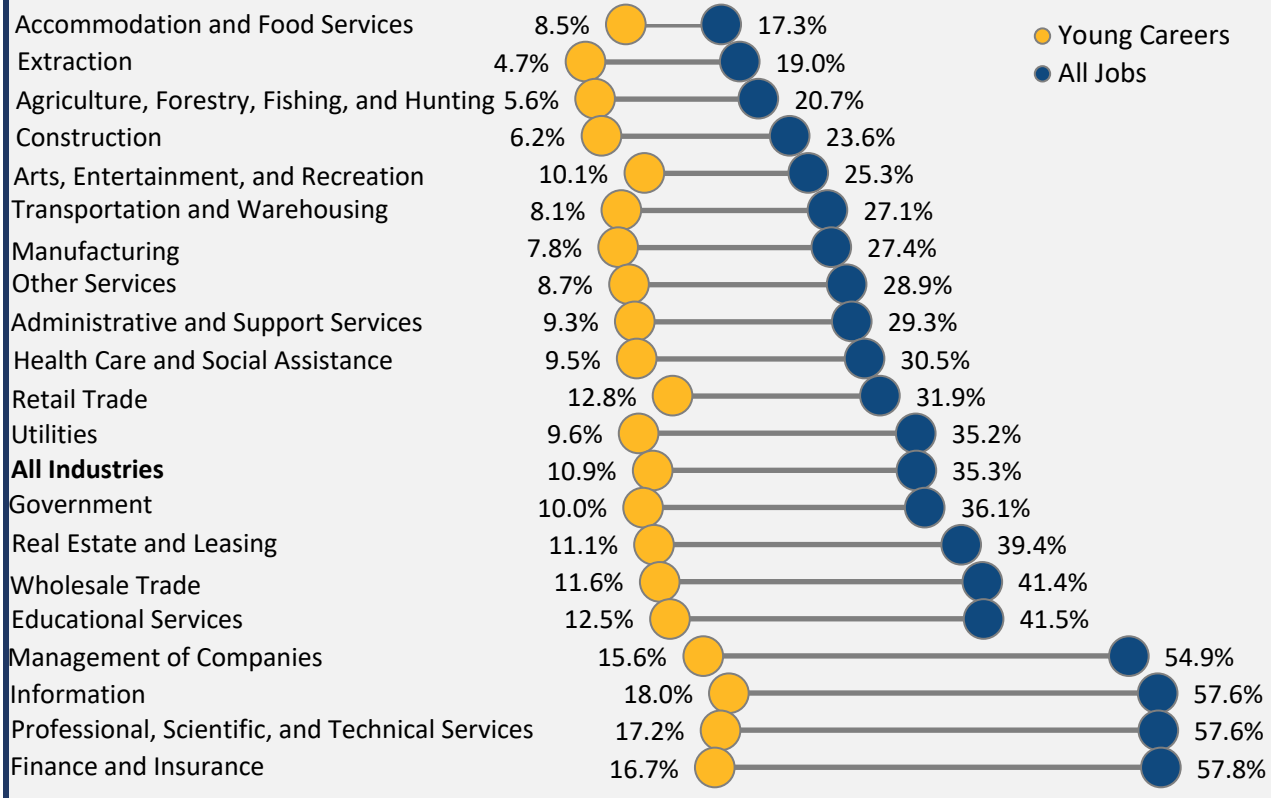
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

Industries with Greatest Exposure to LLMs in Virginia



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

Share of Jobs with AI Exposure to LLMs by Industry



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

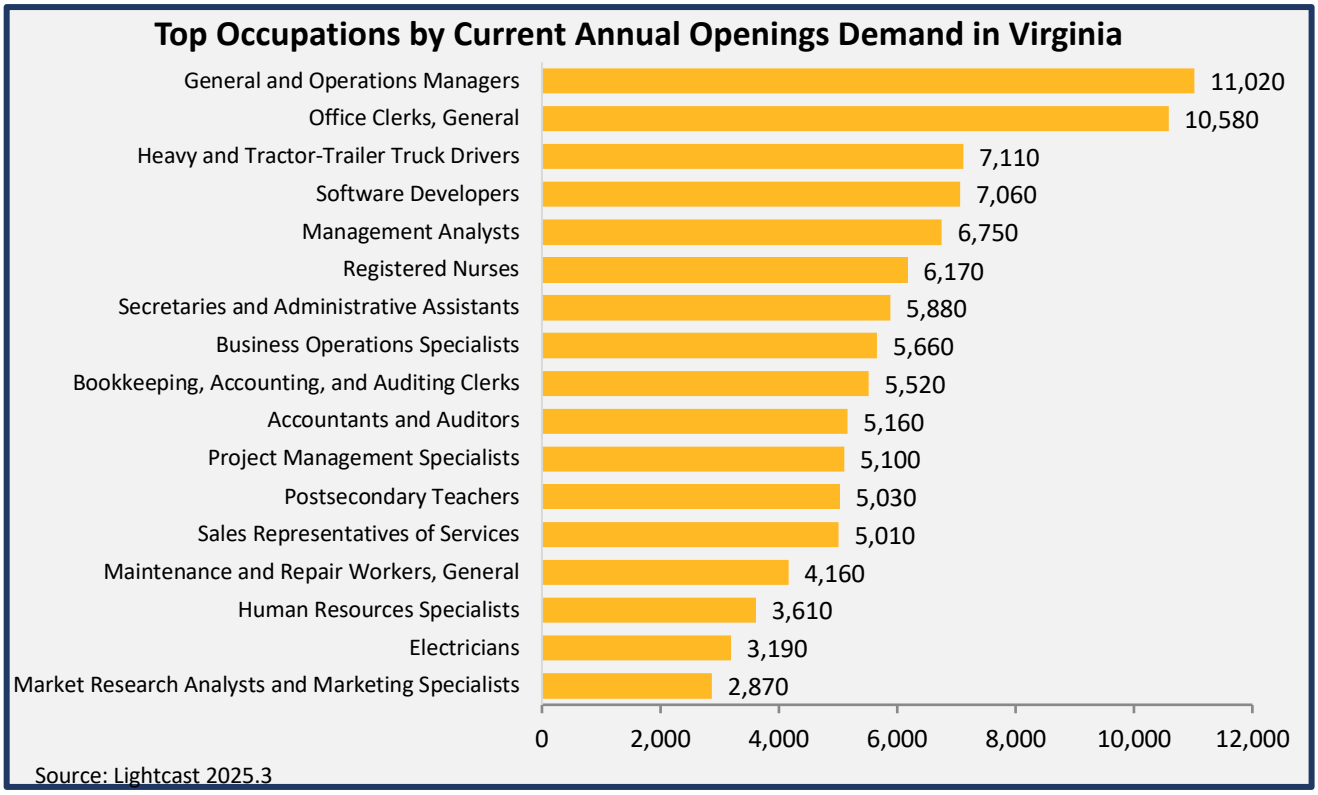
Impacts to Future Demand

It is uncertain to what extent AI exposure will translate into changes in demand. In this next section, EL estimated what the impacts could be to Virginia's workforce demands if AI exposure did correlate with a reduction in demand for those jobs. This serves as an experimental calculation to determine how the workforce needs of state could shift under such a "high impact" scenario. This research can be used to determine the jobs most at risk of AI automation and where workers currently in these fields might need to be upskilled for the jobs of the future.

A labor market data point that can help understand demand is the average number of annual openings. This is a calculation of the jobs needed to be added each year to keep pace with growth as well as replace retiring workers and those that leave the occupation. This metric determines the total number of new workers needed to enter the region or the profession. For many of the key occupations, demand is driven more by replacement than by growth. This explains how industries that are experiencing net job decline can still have difficulty filling their workforce.

The occupations with the top annual openings are often lower paying and do not require any workforce training to be hired. Workforce developers also want to be creating opportunities for local workers to be earning higher wages. Therefore, openings were only reviewed for jobs that pay over $45,000 annually. This helps filter out these lower paying and low training requirement jobs from skewing the analysis and focuses on the types of jobs that can provide a higher wage.' This results in the annual openings for 582 occupations being evaluated for Virginia. Only the full AI exposure was measured, rather than young career impacts, as openings cannot be broken down by age.

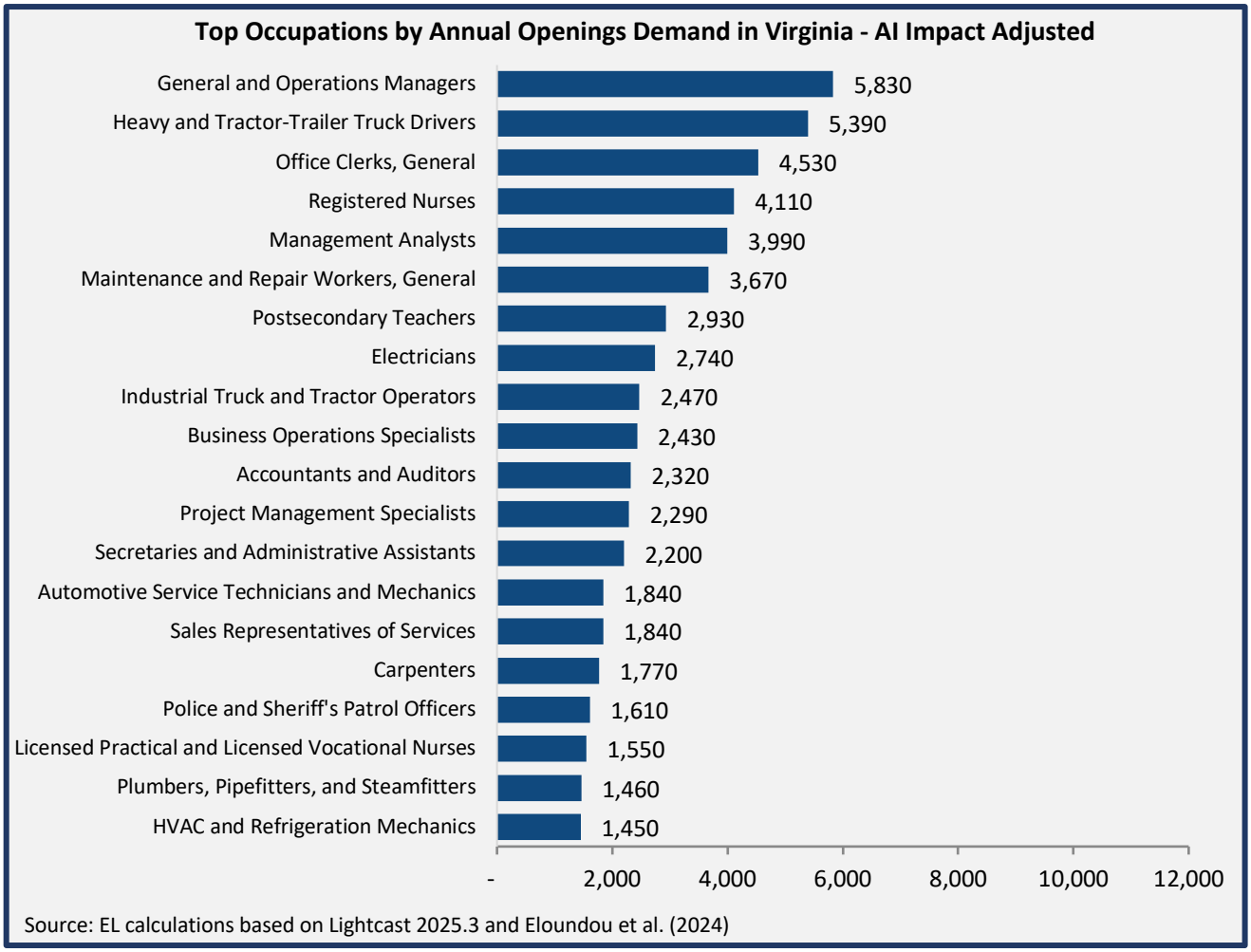
Based on historical trends from 2014 to 2024, the jobs paying over $45,000 per year with the highest demand have been operations managers, office clerks, truck drivers, and software developers. The list is dominated by knowledge-based occupations that often require a bachelor's degree like accountants and registered nurses. Occupations outside of knowledge work like truck drivers, sales representatives, maintenance workers, and electricians round out the top demand list.



A new demand scenario was created by applying the AI exposure scores to the average annual openings. In this AI impact adjusted scenario, annual demand for workers reduces significantly for all top occupations in demand.

The demand for entry-level office clerk roles falls. Midlevel business roles like human resources specialists and marketing analysts fall off the top demand list. Jobs with high human interaction like nursing remain essential and in high demand. Mechanics and production workers that can maintain and operate complex machinery also retain high demand under this AI scenario. Industrial truck operators (includes forklifts), automotive technicians, carpenters, plumbers, and HVAC mechanics all become some of the jobs with the largest demand in the state.

Even jobs with high AI exposure scores remain in the top demand list. There will still be needs for accountants who understand how to utilize the latest financial software. Under such a scenario, accounting teams would likely be smaller but still need a significant number of new workers every year to sustain the state's economy.



Evaluating how the annual openings ranking for an occupation changed between the current and AI scenarios can help demonstrate the shifts to workforce demand. For example, from 2014 to 2024 there was an annual demand of 235 writers and authors to sustain growth and replace workers leaving the occupation. This was the 272nd highest demand among all 582 occupations groups studied in the state. Writers and authors were estimated to have 88 percent of their tasks exposed to AI (Eloundou et al. 2024). Under the AI adjusted scenario, this exposure would correspond with an 88 percent reduction in employment demands for these workers. With these assumptions, the new annual demand would be about 30 openings. Writers and authors now ranked 500th out of 582 occupations for annual openings. This decline in rank position of 228 spots was among the biggest shifts between the two scenarios.

Along with writers, the other occupations that saw their demand ranking fall significantly are highly concentrated on knowledge work in tech or administrative back-office work. Before AI many companies needed talent to help process data and statistics, with AI technology, demand for that type of work in Virginia could fall dramatically if AI automates these jobs.

Jobs in VA that improved their demand tended to have the one or more of the following characteristics:

- maintaining advanced equipment for extraction or production work,

- high dexterity physical tasks (surgical assistants), or
- specialty trades in construction, landscaping, utilities, and repair.

Top Losses and Gains in Demand Ranking by Occupation

Occupation	Rank Change	Occupation	Rank Change
Extruding Machine Operators	+81	Database Administrators	-353
Structural Iron and Steel Workers	+78	Computer Programmers	-345
Machine Operators, Surface Mining	+78	Web Developers	-327
Continuous Mining Machine Operators	+77	Interpreters and Translators	-246
Automotive Glass Repairers	+77	Writers and Authors	-228
Millwrights	+77	Database Architects	-218
Structural Metal Fabricators and Fitters	+77	Software QA Analysts and Testers	-218
Cutting Machine Operators	+77	Payroll and Timekeeping Clerks	-203
Tree Trimmers and Pruners	+76	Web and Digital Interface Designers	-197
Electrical Power-Line Installers	+76	Insurance Claims and Policy Processing Clerks	-174
Surgical Assistants	+75	Court Reporters and Simultaneous Captioners	-158
Brickmasons and Blockmasons	+75	Statisticians	-152
Drywall and Ceiling Tile Installers	+75	Mathematicians	-141
Roofers	+75	Correspondence Clerks	-140
Riggers	+75	Data Scientists	-133

A top goal in workforce efforts is typically to train and provide job openings that provide long-term opportunity and upward mobility. Therefore, the jobs that have high annual openings but have a lower AI exposure may offer the best long-range opportunities. This represents a major shift from previous decades, when obtaining a bachelor's degree was considered a near-certain path to economic security. In the era of rapid AI adoption, that pathway is now far less certain.

To understand how AI could change the types of jobs with the largest gaps between supply and demand, the openings from the AI impact scenario were compared to the number of relevant 2023 postsecondary completions.

A list of jobs with the largest gaps between workforce supply and AI scenario demand was created. The list was filtered down to occupations that require a high school education or higher, earn more than $45,000, and have AI exposure score below 50%. This screens for the higher wage jobs that workforce development seeks and removes jobs that could be heavily impacted by AI in the near or long-term.

The largest training gaps are predicted in trades and higher skill level production jobs. In a high AI impact scenario, electricians would be one of the highest demand jobs where there are currently not enough workers being trained. Under such a scenario, Virginia would be missing about 2,000 of the number of electricians it would need to keep pace. Buyers and purchasing agents is the only occupation group with a large gap that typically requires a bachelor's degree for an entry level position. The remaining

occupations have typical training paths that include certifications, apprenticeships, or on-the-job (OTJ) training. Meanwhile, the educational trend in the state has been the production of more bachelor's and advanced degrees while associate's and certifications have trended downward in recent years.

Jobs in Virginia with Top Supply Gaps Under AI Impact Scenario

Occupation	Supply Gap	Median Annual Earnings	Typical Path
Electricians	-2,020	$61,600	Apprenticeship
Maintenance and Repair Workers, General	-1,620	$49,100	Moderate OTJ Training
Carpenters	-1,600	$50,200	Apprenticeship
Operating Engineers and Other Construction Equipment Operators	-1,200	$52,200	Moderate OTJ Training
Automotive Service Technicians and Mechanics	-1,120	$56,300	Certification
Buyers and Purchasing Agents	-1,115	$84,500	Bachelor's
Dental Assistants	-930	$46,900	Certification
HVAC and Refrigeration Mechanics and Installers	-860	$60,600	Certification
Machinists	-855	$60,900	Long OTJ Training
Bus and Truck Mechanics and Diesel Engine Specialists	-850	$58,500	Long OTJ Training
Inspectors, Testers, Sorters, Samplers, and Weighers	-820	$48,000	Moderate OTJ Training
Plumbers, Pipefitters, and Steamfitters	-730	$59,600	Apprenticeship
Telecommunications Line Installers and Repairers	-670	$80,100	Long OTJ Training
Aircraft Mechanics and Service Technicians	-610	$80,800	Certification
Mobile Heavy Equipment Mechanics, Except Engines	-580	$62,400	Long OTJ Training
Industrial Machinery Mechanics	-570	$62,900	Long OTJ Training
Welders, Cutters, Solderers, and Brazers	-550	$57,300	Moderate OTJ Training
Firefighters	-530	$58,300	Certification
Psychiatric Technicians	-480	$46,000	Certification
Bus Drivers, Transit and Intercity	-480	$51,100	Moderate OTJ Training

Section 5 – Strategic Recommendations

Based on the landscape assessment that surveyed and interviewed Virginia employers, a comprehensive literature and best practice review, and an analysis of potential impacts by region, the following recommendations are made to put the Commonwealth in the best position to mitigate AI impacts and to capitalize on AI opportunities in the workplace and workforce.

Virginia's AI action agenda is organized around these workforce and workplace objectives:

- Future workers need AI familiarity and data literacy
- Incumbent workers need AI training, policy and use clarity and reskilling as their jobs change
- Displaced workers need re-employment training and assistance
- To maximize the benefits of AI, businesses need to strategically deploy AI and provide training and clarity for workers on AI use
- Virginia can be a leading state for AI-related business attraction and expansion if the infrastructure (utility capacity, sites, fiber connectivity) can keep up

The recommendations to achieve these objectives are organized into five goal areas. Implementing the 34 strategies will require multiple partners and various tactics across the five goal areas.

Recommendations and Implementation Partners/Strategies

1. Pursue universal AI literacy across the Commonwealth by deploying AI literacy training resources that every student and every working-age Virginian can easily access	2. Immediately develop new workforce training resources and improve visibility and access to existing training resources to meet the unprecedented volume and demand for training of workplace skills critical in an AI enabled workplace	3. Provide reskilling and upskilling resources for potentially impacted workers and develop re-employment resources specifically for workers displaced by AI	4. Help Virginia businesses and organizations optimize the impact of AI	5. Ensure the infrastructure is in place to support the growth and attraction of AI-related businesses in Virginia
K-12 Post-Secondary Employer Provided Technology Partners Community Organizations	Commonwealth Regional Orgs K-12, Higher Ed Trade and Business Associations SBDC's Industry Consortia AI Training Tax Credits/Grants	Commonwealth Regional Orgs Post-Secondary CTE Programs Re-employment Assistance Orgs	SBDC's Trade and Business Associations Model Policies for Businesses Support for Business Process Redesign AI Deployment Tax Credits/Grants	Utility Capacity Center of Excellence for AI R&D AI Accelerators and Incubators Renew R&D Tax Credits Establish Regional AI Working Groups

Strategic Recommendations

1. **Pursue universal AI Literacy across the Commonwealth of Virginia** - *Pursue universal AI literacy across the Commonwealth by deploying AI literacy training resources that every student and every working-age Virginian can easily access through K-12 education, post-secondary education, and workforce training programs.*

   Recommendations:

   - Build upon the Governor's Executive Order Number 30 and AI Education Guidelines to ensure full implementation across all K-12 public school divisions
   - Ensure all public-school divisions participate in AI literacy and training programs for administrators and teachers offered by VDOE and other training resources (i.e., AI for Education)
   - Ensure higher educational institutions in Virginia have policies to encourage responsible and ethical use of AI in academic programs
   - Encourage and facilitate AI use in higher ed curriculum and classroom activities
   - Require 100 percent of Virginia public school divisions to offer computer science courses and strive to achieve a goal of 20 percent participation
   - Support and encourage employers in making AI training readily available for all existing workers
   - Fund the development and deployment of AI literacy training resources through Virginia Public Television, libraries, museums, and camps

2. **Provide Workplace Training and Transferrable Skills Resources for Incumbent Workers** – *Immediately develop and implement new workforce training resources and improve visibility and access to existing training resources to strengthen incumbent workers' workplace skills and that are essential in an AI-enabled workplace. Training and transferrable skills resources are needed for incumbent workers at all levels within organizations and existing training organizations won't be able to fully meet the unprecedented volume and pace of demand.*

   Recommendations:

   - Establish standardized skills profiles for skills and competencies that are likely to be in demand in an AI enabled workplace (i.e., critical thinking, analytical thinking, change management, business process redesign, resilience, flexibility and agility, systems thinking) with employer input and guidance and disseminate to workforce development partners throughout the Commonwealth
   - Establish and maintain a directory of AI training resources (and related skills and competencies training) that are offered throughout the Commonwealth, and by GO Virginia region, by:
     - technology providers (i.e., Go With Google)
     - online training resources
     - Small Business Development Centers (SBDC's)
     - non-credit training offered by higher ed institutions
     - for-profit training providers (i.e. Stemuli)

- Higher educational institutions, through programs such as VCCS's Fast Forward initiative, should quickly establish non-credit AI training programs for existing workers that can be deployed on-line and in-person, at scale across the Commonwealth
- Develop and deploy a real-time labor market intelligence tool to allow training providers and firms to quickly respond to training demands as they emerge
- Through GO Virginia and the Virginia Chamber of Commerce, regularly gather input and guidance from the business community to inform AI workforce development needs, challenges, and emerging transferrable skill opportunities (see Appendix C for examples of transferrable skills analyses)
- GO Virginia regional organizations should regularly convene workforce development partners in each region to disseminate AI-related training demand information that illustrates the occupation and industry-specific training needs that are rapidly emerging and that can inform development of GO Virginia eligible planning and implementation projects by these partners
- Business schools should develop credit and non-credit training resources focused on business process redesign, systems thinking, and change management for managers who are leading the deployment of ethical AI tools and resources in a rapidly changing workplace
- Community Colleges should consider joining an AI community college consortium (i.e., National Applied AI Consortium) to fast-track the development of AI related curriculum
- Trade Associations, the Virginia Chamber of Commerce and Local Chambers of Commerce should consider providing AI-related training as a resource for members and to other organizations needing training resources through partnerships (i.e., Michigan Municipal League's Artificial Intelligence Handbook for Local Government)
- Industry consortia (i.e. CCALS) and industry trade associations should be encouraged and resourced to offer industry-specific AI training
- Consider enacting tax credits or grants to offset the cost of AI-related training of existing workers in Virginia based businesses/organizations

3. **Training and Resources for Workers Impacted by AI Deployment** - *Provide reskilling and upskilling resources for any displaced workers and develop re-employment resources specifically for workers impacted by AI.*

   Recommendations:

   - Target displaced worker training resources and re-employment resources to regions with the highest levels of potentially impacted workers
   - Establish an AI re-employment office that could link displaced workers to retraining and financial resources
   - Provide time-limited access to wrap-around support infrastructure that can include transportation, childcare, scholarships and other resources that will help eliminate potential barriers that could keep displaced workers from accessing training

4. **Assistance for Virginia businesses and organizations to optimize the impact of AI** - *Help Virginia businesses and organizations by providing tools, technical assistance and resources so that they can optimize the impact of AI.*

   Recommendations:

   - Provide employers with guidance and model policies to assist them in developing clear and simple guidance regarding AI use by employees
   - Provide employers with real-time AI occupational impact data and information about to support their workforce planning and talent management efforts in guiding existing workers who are likely to be impacted to training and upskilling opportunities
   - Include AI deployment support in the suite of technical assistance services offered through all of Virginia's SBDC's and other small business support organizations
   - Establish targeted funding and/or Virginia tax credits to assist businesses in offsetting the cost of deploying AI tools within their business
   - Encourage employers to offer time and incentives to employees to encourage the pursuit of upskilling
   - Encourage training for managers in business process redesign, systems thinking and change management (i.e., AI Mindset Program, Harvard Business School)

5. **Ensure the infrastructure is in place to support the growth and attraction of AI-related businesses in Virginia** - *Virginia is better positioned than most states to attract and grow AI-related firms if sufficient electric capacity, sites and locations, and capital is available into the future.*

   Recommendations:

   - Ensure sufficient generation and distribution of electric power to support the continued attraction and development of technology firms in Virginia
   - Promote Virginia as a top location for AI business development due to the prevalence of tech talent, training resources, data centers, data connectivity and existing tech firms – promotion could include organizing an annual "Virginia AI and Data Summit" that brings together top Federal and state leaders and leading AI firms to discuss issues and promote Virginia's inherent strengths for AI development
   - Establish regional public-private innovation districts or AI working groups to focus on regional AI-related workforce and business impacts and opportunities (i.e., AI Ready RVA)
   - Support the establishment of a Virginia AI Center of Excellence that involves multiple higher education institutions throughout the Commonwealth to serve as a hub for industry-informed research and development with potential pilot projects in Northern Virginia and Hampton Roads
   - Establish AI-focused technology accelerators and incubators in regions across the Commonwealth
   - Reinstate and expand R&D tax credits for AI firms and other Virginia businesses
   - Establish a Virginia AI Investment Fund to invest in early- and growth-stage AI companies located in the Commonwealth of Virginia.

Section 6 – Conclusion

An assessment of the AI landscape in Virginia indicates that while the Commonwealth is early in the AI-era and full implications are somewhat unclear, AI tools are forecasted to change hundreds of thousands of jobs across the Commonwealth and will eliminate thousands of others as they currently exist. AI will also certainly create new business opportunities and new jobs in Virginia as a result. Throughout the period of AI ramp-up and adoption, significant disruptions and changes are likely for workers and businesses in every region of Virginia.

Fortunately, Virginia's proactive efforts over the past two years to focus on AI literacy and on creating conditions for existing businesses to take advantage of AI tools puts the Commonwealth in a strong position to mitigate AI impacts and capitalize on opportunities during this time of transition.

Much of the significant work required over the next five years to equip Virginia's workers and businesses the with training, tools and resources to adjust to AI-related workforce and workplace changes and to capitalize on AI-related opportunities is just getting started and will be essential during this period of technological change. It will require the focus and coordination of existing organizations and structures and the deployment of new tools and resources as well.

Through successful implementation of strategies to prepare Virginia's businesses and workforce, Virginia should be in one of the strongest positions among all states to capitalize on AI-related opportunities and mitigate disruptions and impacts associated with the advancement and deployment of transformative AI technologies.

This report was written and researched by Mike Malone, Ted Abernathy, Skylar Casey, Carly Kirkman, Kendall Abernathy, and Casey Steinbacher of Economic Leadership LLC.

Appendices

Appendix A – Virginia AI Landscape Assessment Survey Summary

Appendix B – Regional Impact Forecasts

Appendix C – Transferrable Skills Analysis

Appendix A – Virginia AI Landscape Assessment Survey Summary

A survey assessing AI-related perspectives and opinions was completed by 58 respondents representing industry, non-profits, government perspectives. Responses were received from eight of the nine GO Virginia regions.

The Virginia AI Landscape Assessment survey reveals that AI adoption is already widespread, with 95 percent of respondents reporting current use of AI tools, often on a daily or weekly basis. Most participants (62 percent) view AI as an opportunity, though usage is largely informal (59% without policies) and ROI measurement is limited (46 percent not tracking). While some organizations are beginning to adapt hiring and training practices, large gaps remain in formal workforce development. Respondents emphasized the need for practical, sector-specific training, leadership guidance, and statewide collaboration to ensure Virginia remains competitive in an AI-driven economy.

Five Main Takeaways

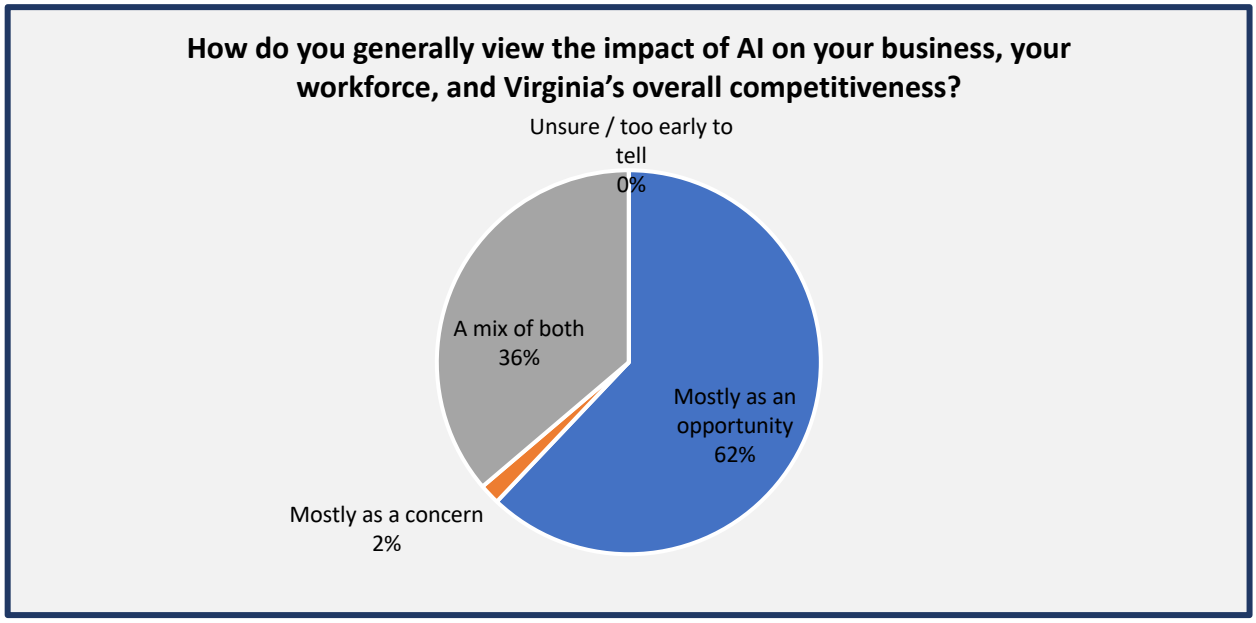
1. **AI Adoption Is High but Informal** – Nearly all respondents (95 percent) use AI at work, with 48 percent using it daily. However, 59 percent said their organizations use AI without formal policies, and only 7 percent track ROI with clear metrics.
2. **Training Gaps Are Significant** – Just 31 percent of organizations are actively training employees on AI, while 38 percent are still planning and 28 percent offer none at all. Training is often ad hoc: many respondents cited informal knowledge sharing as their current method.
3. **Hiring and Skills Needs Are Shifting** – Only 10 percent expect to hire fewer workers overall due to AI, but 21 percent anticipate hiring for new roles and skill sets. Meanwhile, 33 percent are seeking AI skills across most roles, yet 24 percent remain unsure of their hiring approach.
4. **Leaders Need Practical, Hands-On Support** – Respondents stressed that managers and executives require real-world examples, sample policies, and "sandbox" experimentation. Currently, just 36 percent of training is delivered in-house, and only 4 percent comes from local/regional providers, suggesting a gap in leadership-focused resources.
5. **Collaboration and Guardrails Are Priorities** – While 83 percent of respondents report co-workers are also using AI, many warned about ethical, security, and cultural risks. Recommendations included closing adoption gaps (especially among women), launching regional AI hubs, and establishing statewide guidelines to ensure responsible, inclusive use.

Question 1: How do you generally view the impact of AI on your business, your workforce, and Virginia's overall competitiveness?

Answer Options:

- Mostly as an opportunity – 62%

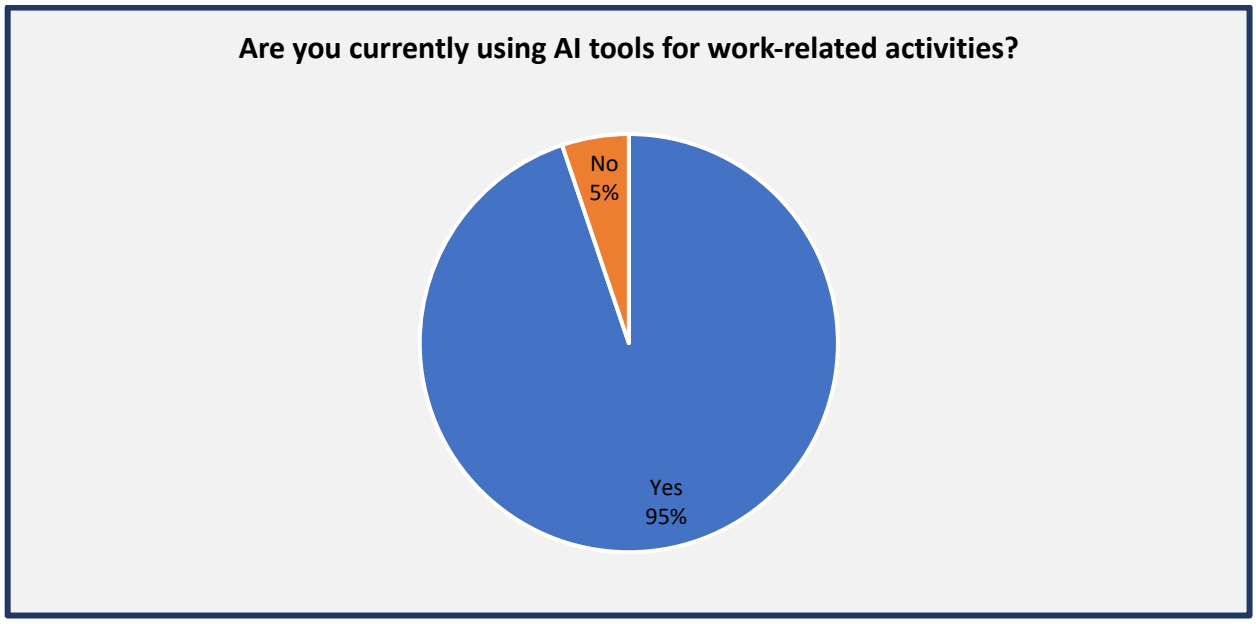
- Mostly as a concern – 2%
- A mix of both – 36%
- Unsure / too early to tell – 0%



Question 2: Are you currently using AI tools for work-related activities?

Answer Options:

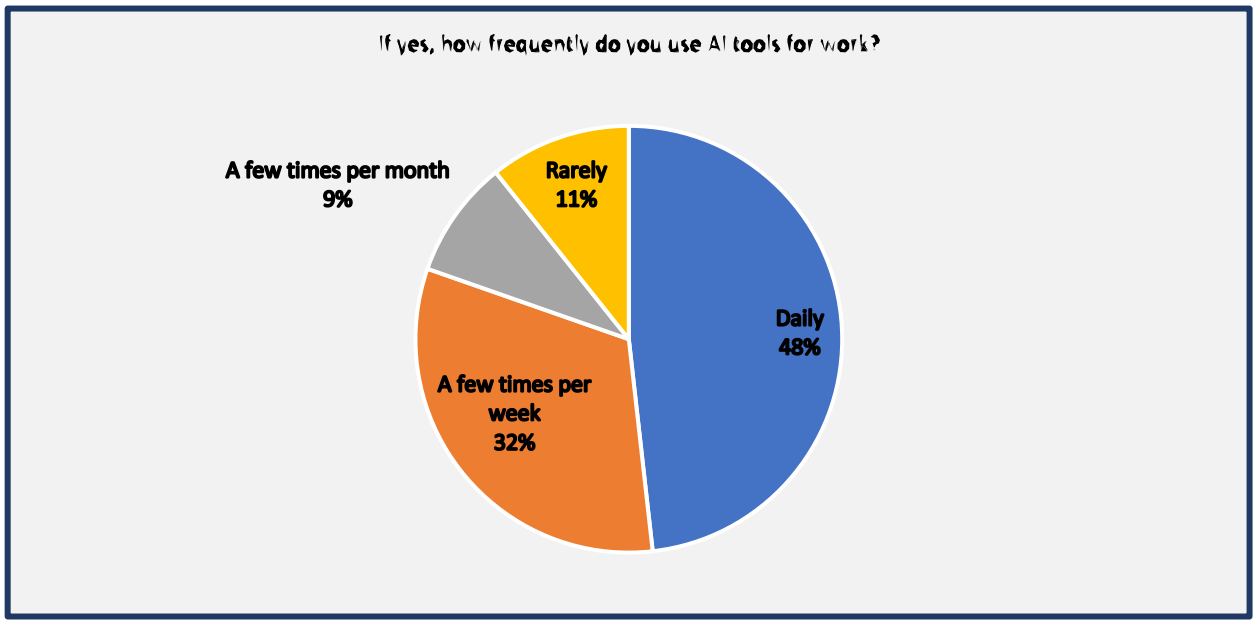
- Yes – 95%
- No – 5%



Question 3: If yes, how frequently do you use AI tools for work?

Answer Options:

- Daily – 48%
- A few times per week – 32%
- A few times per month – 9%
- Rarely – 11%

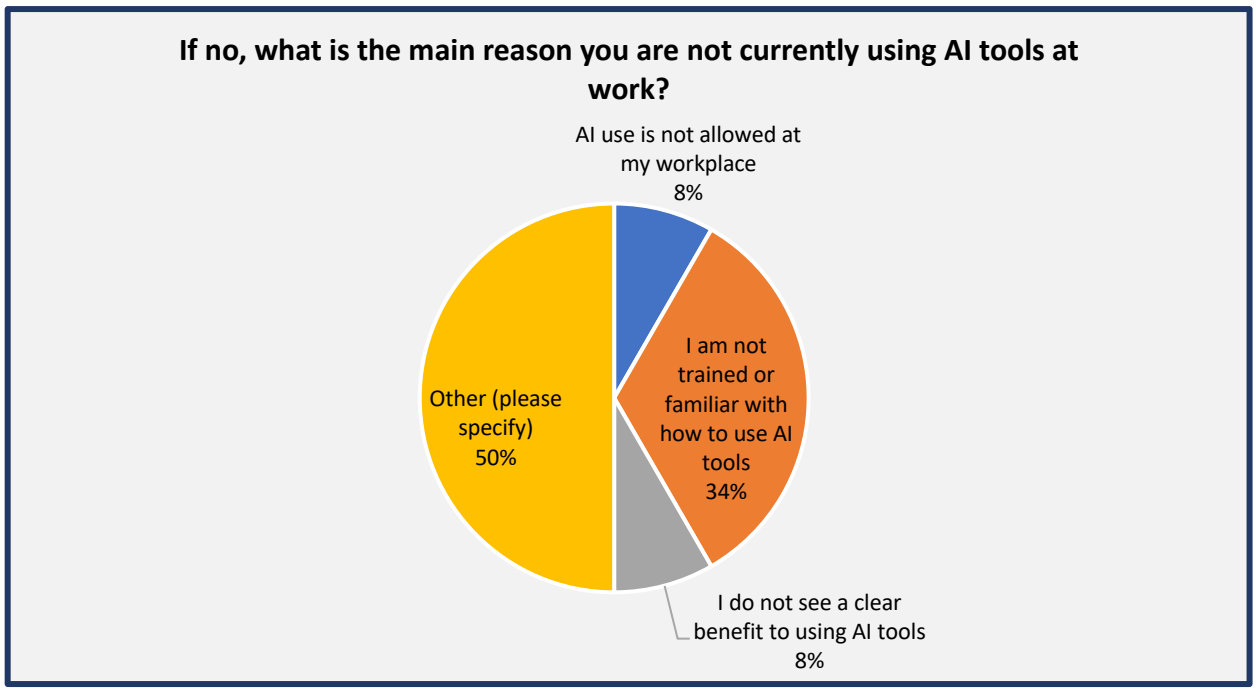


Question 4: If no, what is the main reason you are not currently using AI tools at work?

Answer Options:

- AI use is not allowed at my workplace – 8%
- I am not trained or familiar with how to use AI tools – 33%
- I do not see a clear benefit to using AI tools 8%
- Other – 6%
    - "HIPPA"
    - "I'm not yet sure the best way to install AI into my workplace"
    - "I am concerned about the environment/energy and cognitive impacts of AI"
    - "I oppose the use of AI for creative tasks and actively choose not to use it"
    - "I'm not generally stuck in workflow currently, and I only use for format-based/organizational purposes"

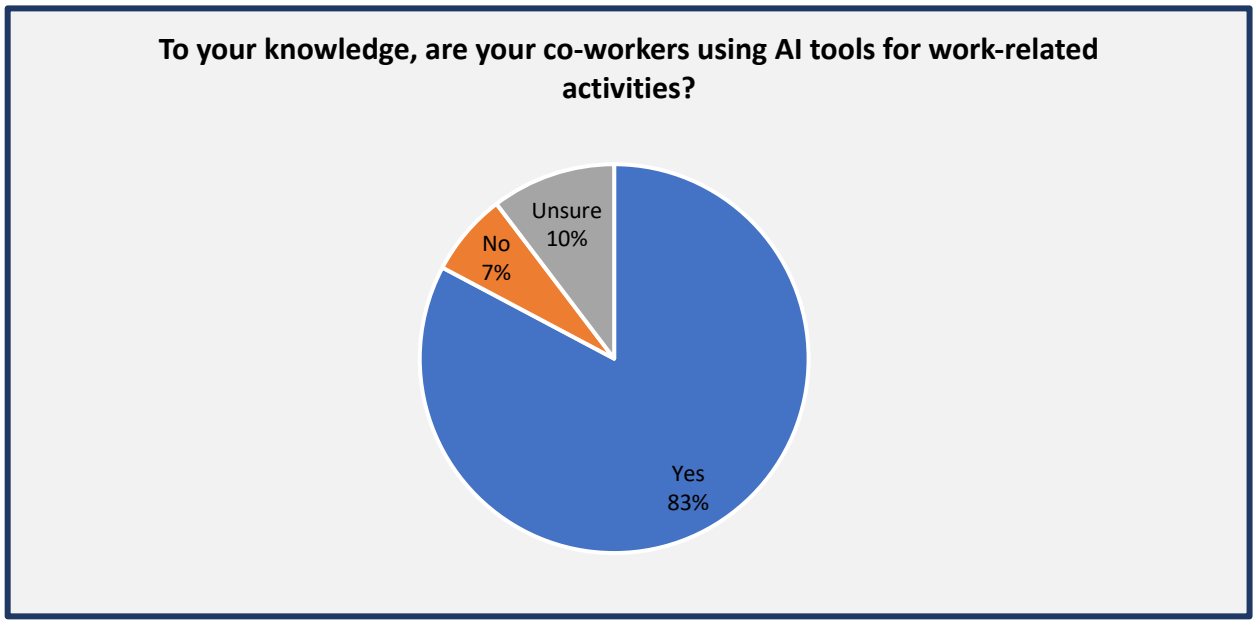
****NOTE: Although three respondents answered "no" to question 2, 12 answered question four.****



Question 5: To your knowledge, are your co-workers using AI tools for work-related activities?

Answer Options:

- Yes – 83%
- No – 7%
- Unsure – 10%

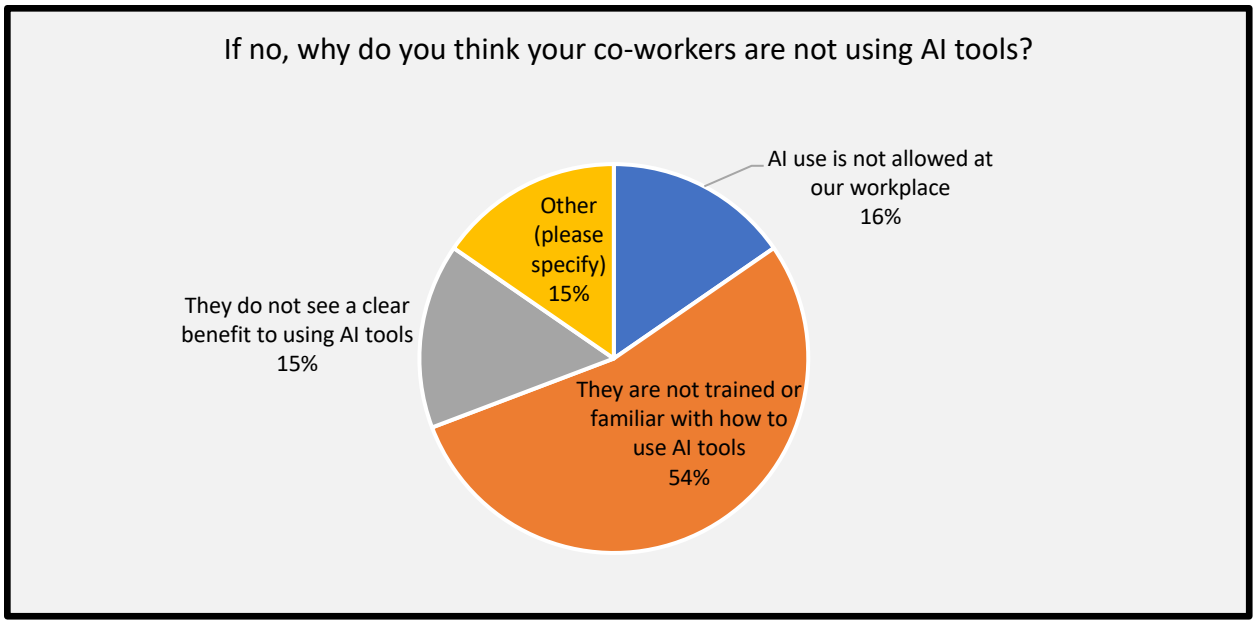


Question 6: If no, why do you think your co-workers are not using AI tools?

Answer Options:

- AI use is not allowed at our workplace – 15%
- They are not trained or familiar with how to use AI tools – 54%
- They do not see a clear benefit to using AI tools – 15%
- Other – 15%
    - "I don't know"

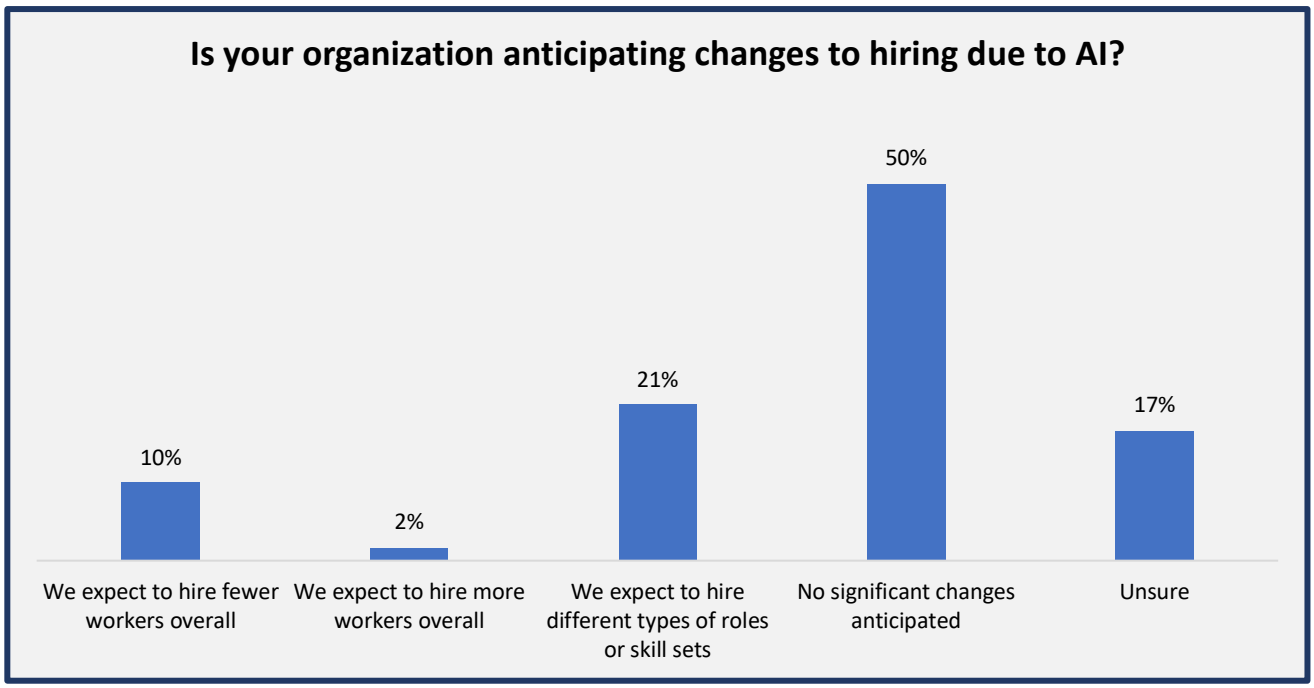
****NOTE: Although four respondents answered "no" to question five, 13 answered question six****



Question 7: Is your organization anticipating changes to hiring due to AI?

Answer Options:

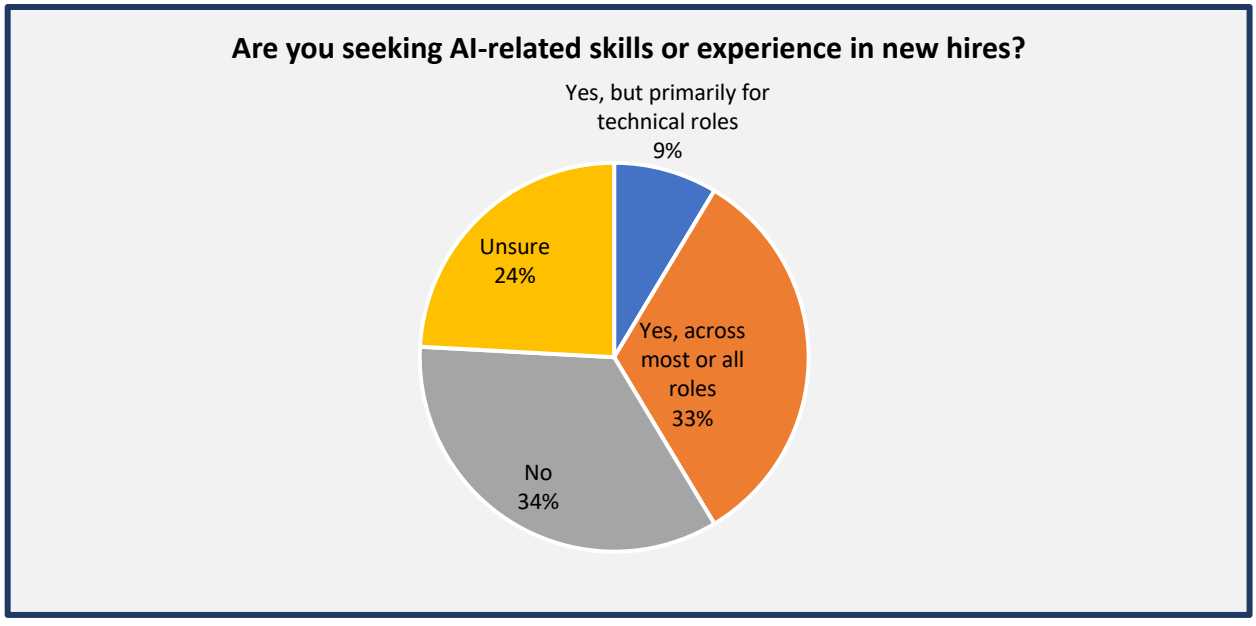
- We expect to hire fewer workers overall – 10%
- We expect to hire more workers overall – 2%
- We expect to hire different types of roles or skill sets – 21%
- No significant changes anticipated – 50%
- Unsure – 17%



Question 8: Are you seeking AI-related skills or experience in new hires?

Answer Options:

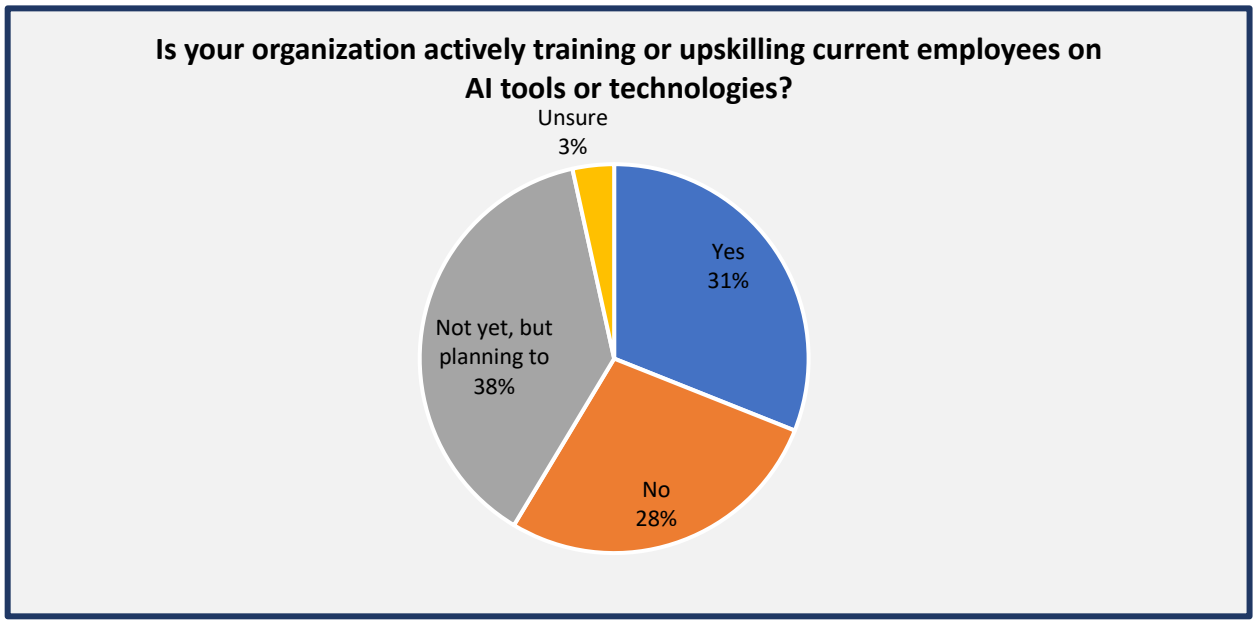
- Yes, but primarily for technical roles – 9%
- Yes, across most or all roles – 33%
- No – 34%
- Unsure – 24%



Question 9: Is your organization actively training or upskilling current employees on AI tools or technologies?

Answer Options:

- Yes – 31%
- No – 28%
- Not yet, but planning to – 38%
- Unsure – 3%

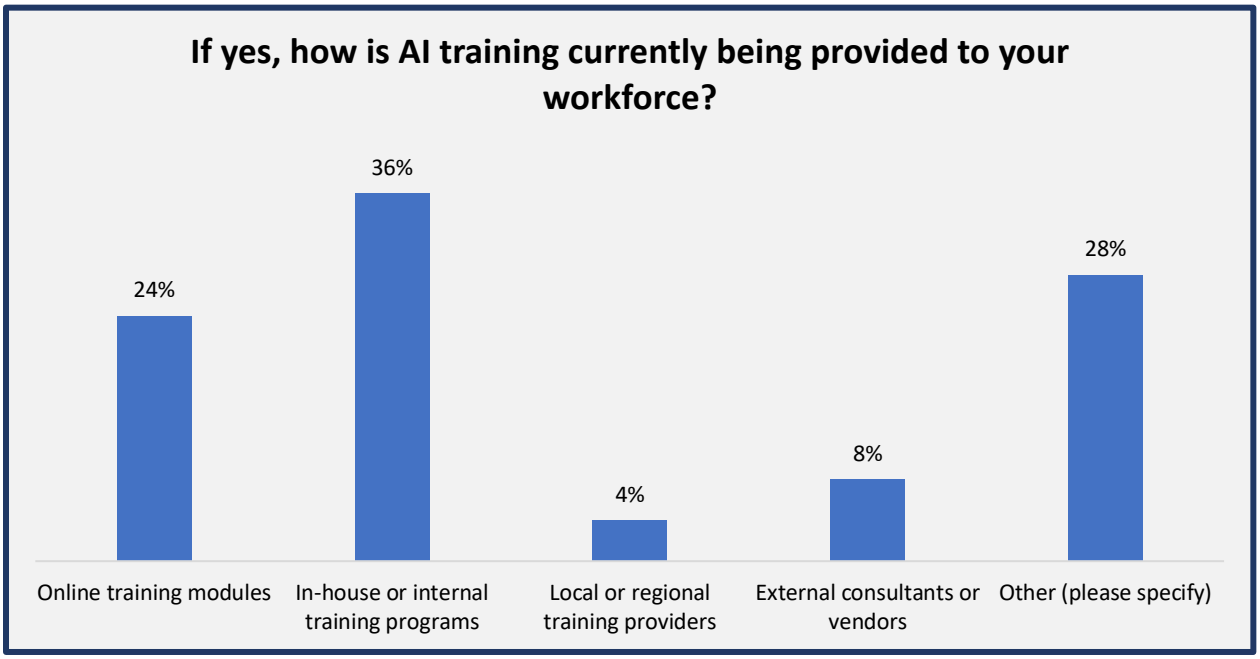


Question 10: If yes, how is AI training currently being provided to your workforce?

Answer Options:

- Online training modules – 24%
- In-house or internal training programs – 36%
- Local or regional training providers – 4%
- External consultants or vendors – 8%
- Other – 28%
    - "External experts"
    - "We are planning training - no organizational training sessions have started to date."
    - "We provided regional in-person sessions for school division cabinet level teams... not specifically for my place of employment (education association)."
    - "informal / organic sharing of knowledge - word of mouth"
    - "Single members piloting platforms"

- "Combination of modalities"



Question 11: Please list any AI-related training programs, certifications, or resources that your organization currently uses or requires.

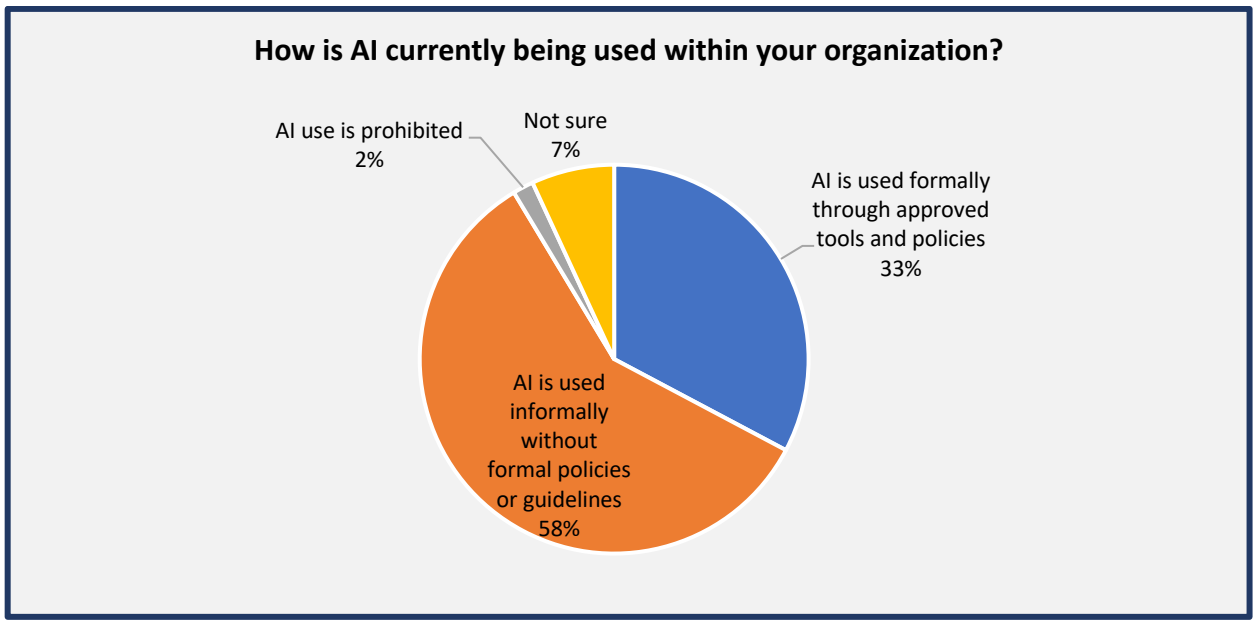
- "Our organization offers these programs to women in law worldwide."
- "Nvidia AI training"
- "ChatGPT"
- "AI faculty committee. Local and statewide webinars and training"
- "This is the AI professional learning that we provided for VA school division cabinet level teams...not for my specific workplace. https://alplearn.com/cohort/vass-gen-ai-year-of-learning/"
- "We are leaning on individual innovation followed by peer learning and peer support as opposed to a top-down approach."
- https://www.civicinnovation.ai/
- "Internal AI tool"
- "Spark"
- "n/a, if any, co-pilot related that is integrated into microsoft suite"

Question 12: How is AI currently being used within your organization?

Answer Options:

- AI is used formally through approved tools and policies – 33%
- AI is used informally without formal policies or guidelines – 59%

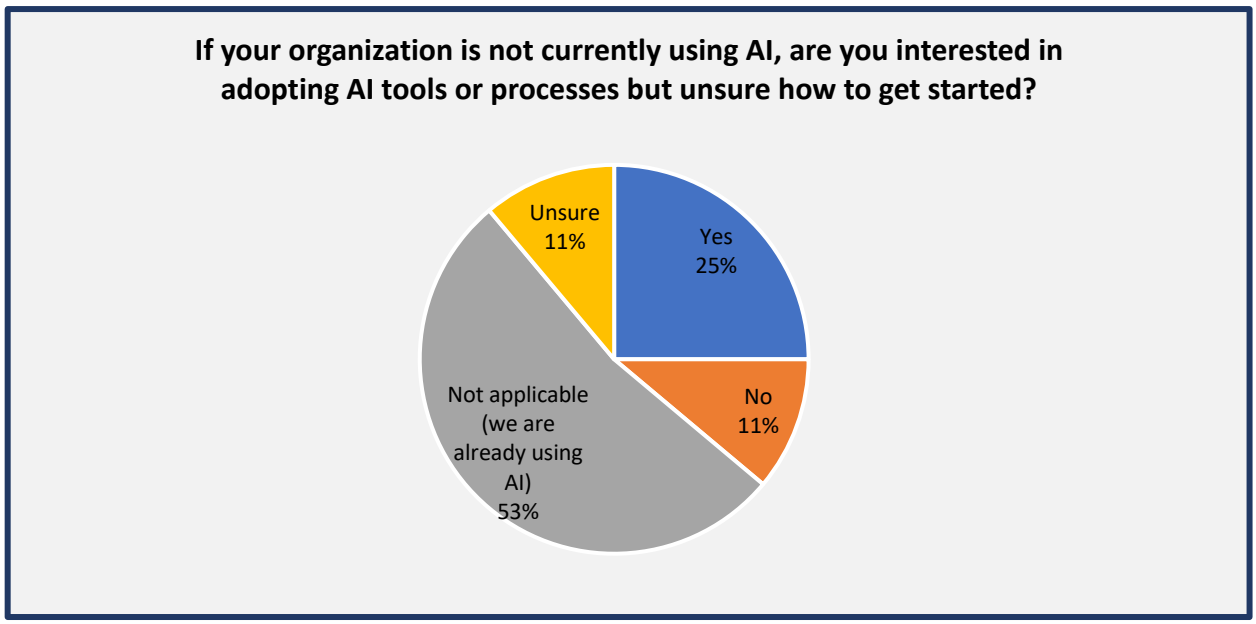
- AI use is prohibited – 2%
- Not sure – 7%



Question 13: If your organization is not currently using AI, are you interested in adopting AI tools or processes but unsure how to get started?

Answer Options:

- Yes – 25%
- No – 11%
- Not applicable (we are already using AI) – 53%
- Unsure – 11%



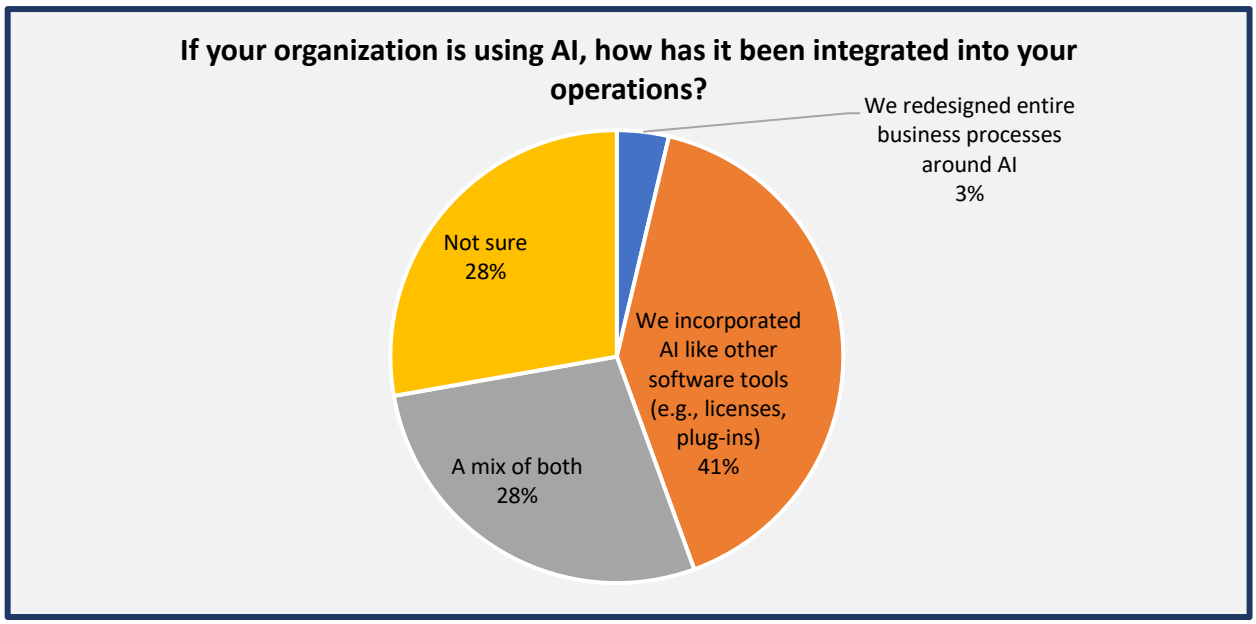
Question 14: If yes, what kind of support or resources would help you get started?

- "Funding opportunities in support of AI upskilling and training programs"
- "Smart and secure implementation"
- "No Idea"
- "Beginner training programs and uses as to how AI could be applied for a variety of jobs"
- "Training for faculty and staff on use of AI Tools. Accesses to AI tools"
- "Not sure"
- "AI policy - secure tools - specific chat to my company - knowing support available"
- "We are concerned about the environmental and cultural impacts to using AI and try to use it sparingly."

Question 15: If your organization is using AI, how has it been integrated into your operations?

Answer Options:

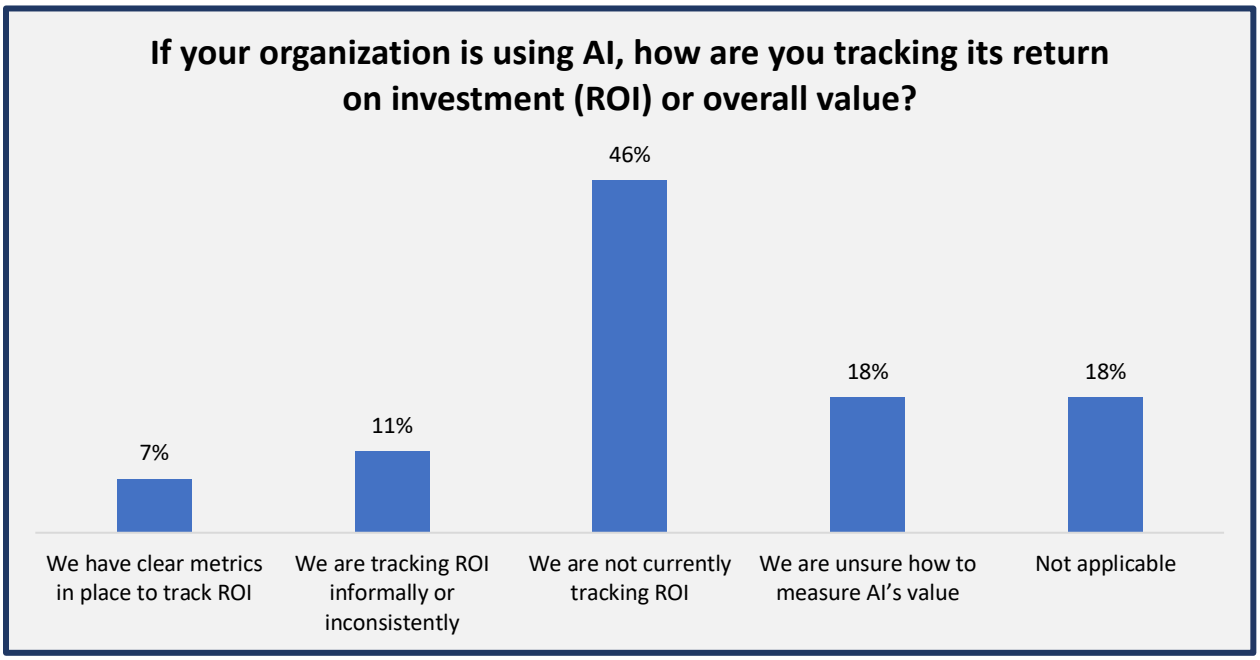
- We redesigned entire business processes around AI – 4%
- We incorporated AI like other software tools (e.g., licenses, plug-ins) – 41%
- A mix of both – 28%
- Not sure – 28%



Question 16: If your organization is using AI, how are you tracking its return on investment (ROI) or overall value?

Answer Options:

- We have clear metrics in place to track ROI – 7%
- We are tracking ROI informally or inconsistently – 11%
- We are not currently tracking ROI – 46%
- We are unsure how to measure AI's value – 18%
- Not applicable – 18%



Question 17: What should training providers do to support businesses and workers as AI adoption accelerates?

Summary

Respondents want AI training to be practical, ongoing, and easy to understand, with clear, industry-specific use cases. They recommend starting with basic "AI 101" sessions, then moving to sector-focused applications, offering both free and paid options, and including guidance on ethics, security, and critical thinking.

Top Pull Quotes

1. *"First, help us see the possible—how could/should this be an opportunity we should embrace? Then, practical tools—'it can do X, here's how you would do that.'"*
2. *"Condense the overwhelming amount of information available currently and offer industry and position-specific training on how to adopt and incorporate AI."*
3. *"Training providers should encourage critical thinking skills when adopting AI… We need to be asking 'When should we be using AI?', not just 'How can we be using AI?'"*

Question 18: What types of training or resources would be most helpful for managers and organizational leaders as AI adoption increases?

Summary

Respondents want practical, ongoing, and hands-on AI training for managers and leaders, with real-world examples, sector-specific best practices, and clear guidance on ethics, security, and compliance. Many recommended case studies, sample policies, and safe "sandbox" environments for experimentation, as well as integrating AI directly into training programs. Training should start with foundational knowledge and evolve into tailored, "just-in-time" learning as new applications emerge.

Top Pull Quotes

1. *"For them to experiment with it themselves instead of just reading about it… so that they have a safe sandbox to play in."*
2. *"Dynamic solutions that… 'transcend' training as one-shot knowledge transfer is not likely to align with the new normal."*
3. *"Examples of how similar workplaces are using AI safely and effectively. Sample policies, processes, frameworks."*

Question 19: What additional ideas or recommendations would you offer to leaders, policymakers, and educators to help Virginia's workforce and businesses successfully adapt to—and thrive in—the age of AI?

Summary

Respondents urged cross-sector collaboration and clear statewide policies, paired with hands-on, lifelong learning for leaders and educators. They highlighted inclusion (closing adoption gaps), affordability, curriculum integration, and prudent guardrails on security, ethics, and accuracy.

Top Pull Quotes

1. *"AI is the new electricity and/or world-wide web. Both were scary at first, companies that didn't embrace them later failed. For Virginia to be a leader on making sure our businesses, nonprofits, educational systems, etc. are using AI effectively is critical to our economy."*
2. *"We need clear guideline, procedures, and best practices on usage of AI within the confines of state contract work."*
3. *"Virginia should invest in the positions necessary to support data centers and their supply chains (i.e., advanced manufacturing and materials science, energy storage and management [input and output], information technology, etc.)."*

Question 20: Which of the following best describes your organization?

Answer Options:

- Private business – 49%
- Nonprofit organization – 18%
- Educational institution – 14%
- Government agency – 7%
- Economic development organization – 7%
- Industry/trade association – 0%
- Other – 5%
    - "Financial Institution"
    - "Large public company"
    - "For profit business"

Question 21: Which industry sector best describes the primary focus of your organization's work or mission?

Answer Options:

- Manufacturing – 5%
- Transportation / Logistics / Warehousing – 5%
- Information Technology / Software / Cybersecurity – 4%
- Healthcare / Life Sciences – 4%
- Energy / Utilities / Environmental Services – 2%
- Finance / Real Estate / Professional Services – 21%
- Construction / Engineering / Skilled Trades – 7%
- Education / Government / Nonprofit – 35%
- Other – 18%

Question 22: Approximately how many employees work at your organization (including all locations)?

Answer Options:

- Fewer than 10 employees – 23%
- 10–24 employees – 13%
- 25–49 employees – 11%
- 50–99 employees – 7%
- 100–249 employees – 16%
- 250–499 employees – 13%
- 500–999 employees – 4%
- 1,000 or more employees – 21%
- Other – 2%

Question 23: Which of the following best describes your role?

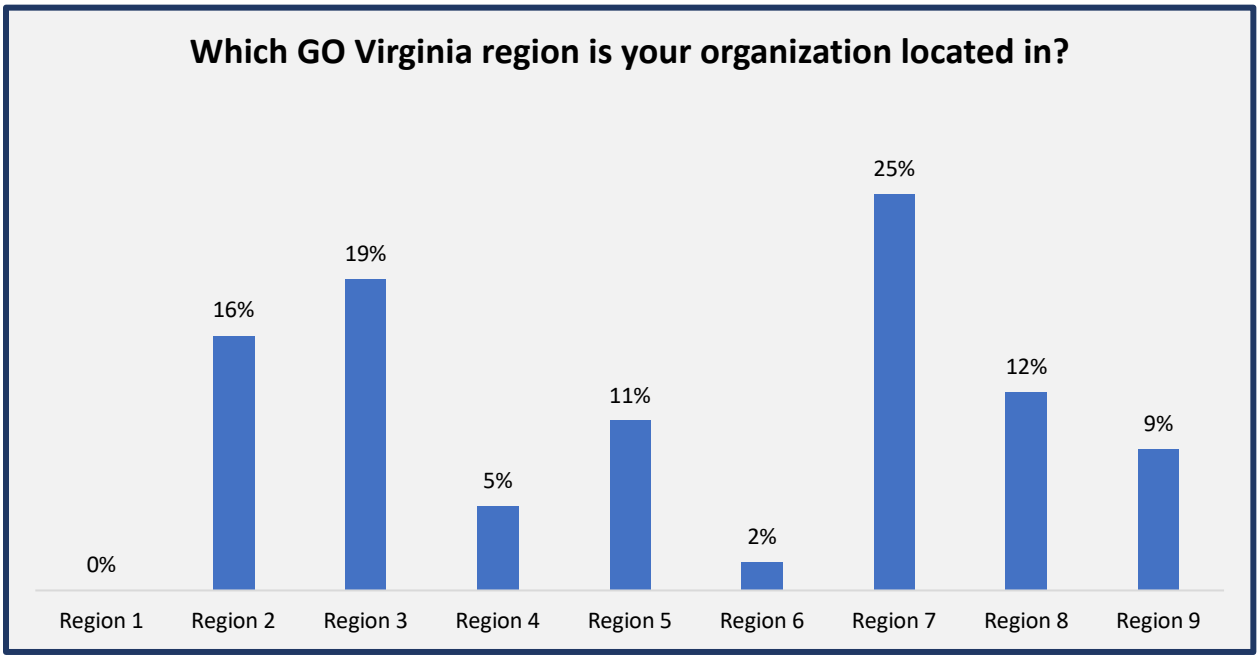
Answer options:

- Senior leadership (e.g., CEO, Executive Director, Owner) - 65%
- Mid-level management - 23%
- Technical/operational staff - 9%
- HR or training lead - 0%
- Other - 4%
    - program manager
    - research associate

Question 24: Which GO Virginia region is your organization located in? If you're unsure, click here for a map of the 9 GO Virginia regions or refer to the list of localities provided. If your organization operates in multiple regions, please select the one that best reflects your primary area of activity or where your AI efforts are most concentrated.

- Region 1 (Bristol, Galax, and Norton; and the counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe) - 0%
- Region 2 (Covington, Lynchburg, Radford, Roanoke, and Salem; and the counties of Alleghany, Amherst, Appomattox, Bedford, Botetourt, Campbell, Craig, Floyd, Franklin, Giles, Montgomery, Pulaski, and Roanoke) - 16%
- Region 3 (Danville and Martinsville; and the counties of Amelia, Brunswick, Buckingham, Charlotte, Cumberland, Halifax, Henry, Lunenburg, Mecklenburg, Nottoway, Patrick, Pittsylvania, and Prince Edward) - 19%
- Region 4 (Colonial Heights, Emporia, Hopewell, Petersburg, and Richmond; and the counties of Charles City, Chesterfield, Dinwiddie, Goochland, Greensville, Hanover, Henrico, New Kent, Powhatan, Prince George, Surry, and Sussex) - 5%
- Region 5 (Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; and the counties of Accomack, Isle of Wight, James City, Northampton, Southampton, and York) - 11%
- Region 6 (Fredericksburg; and the counties of Caroline, Essex, Gloucester, King and Queen, King George, King William, Lancaster, Mathews, Middlesex, Northumberland, Richmond, Spotsylvania, Stafford, and Westmoreland) - 2%
- Region 7 (Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park; and the counties of Arlington, Fairfax, Loudoun, and Prince William) - 25%
- Region 8 (Buena Vista, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester; and the counties of Augusta, Bath, Clarke, Frederick, Highland, Page, Rockbridge, Rockingham, Shenandoah, and Warren) - 12%

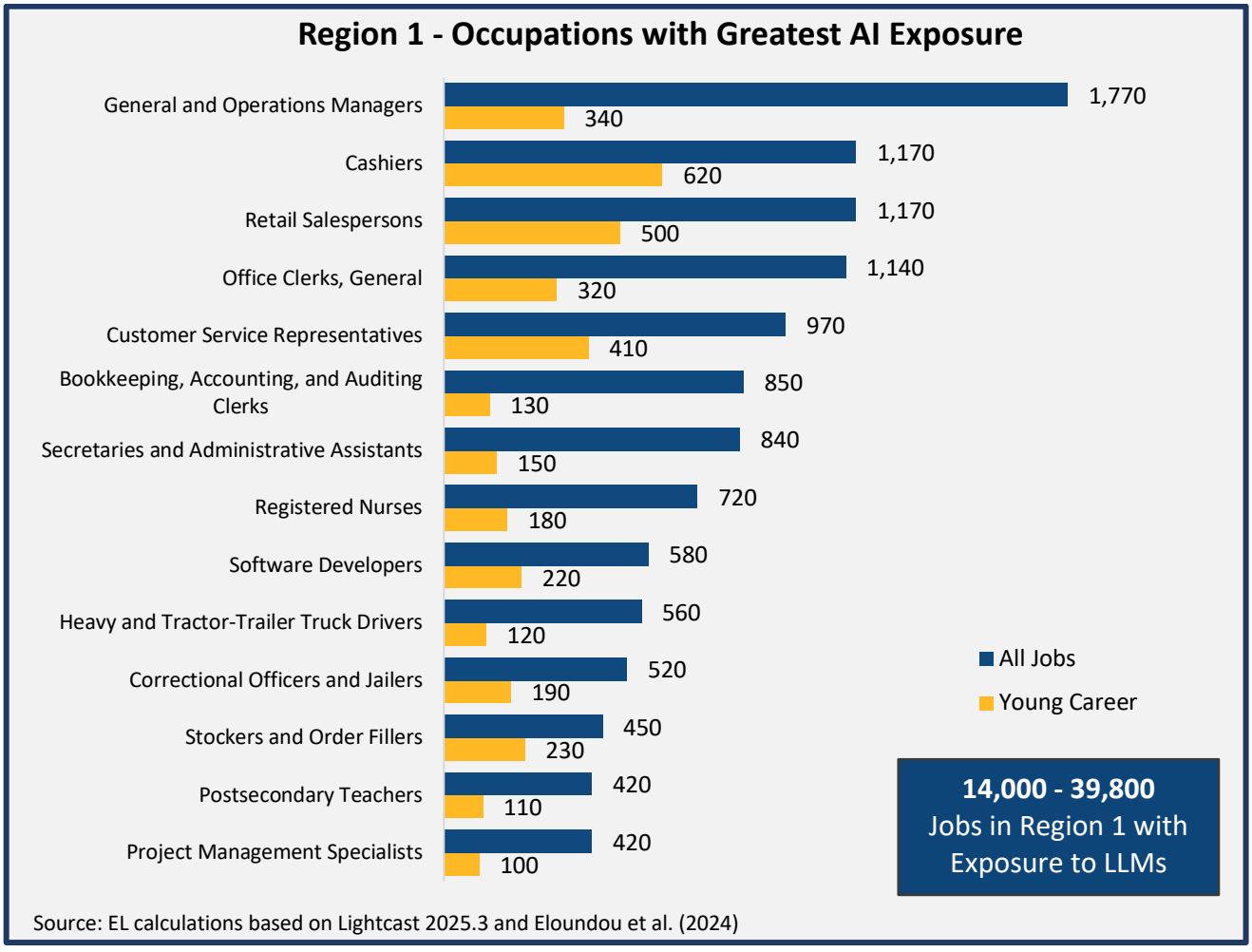
- Region 9 (Charlottesville; and the counties of Albemarle, Culpeper, Fauquier, Fluvanna, Greene, Louisa, Madison, Nelson, Orange, and Rappahannock) - 9%
- Other - 2%
    - "Prefer to not answer"



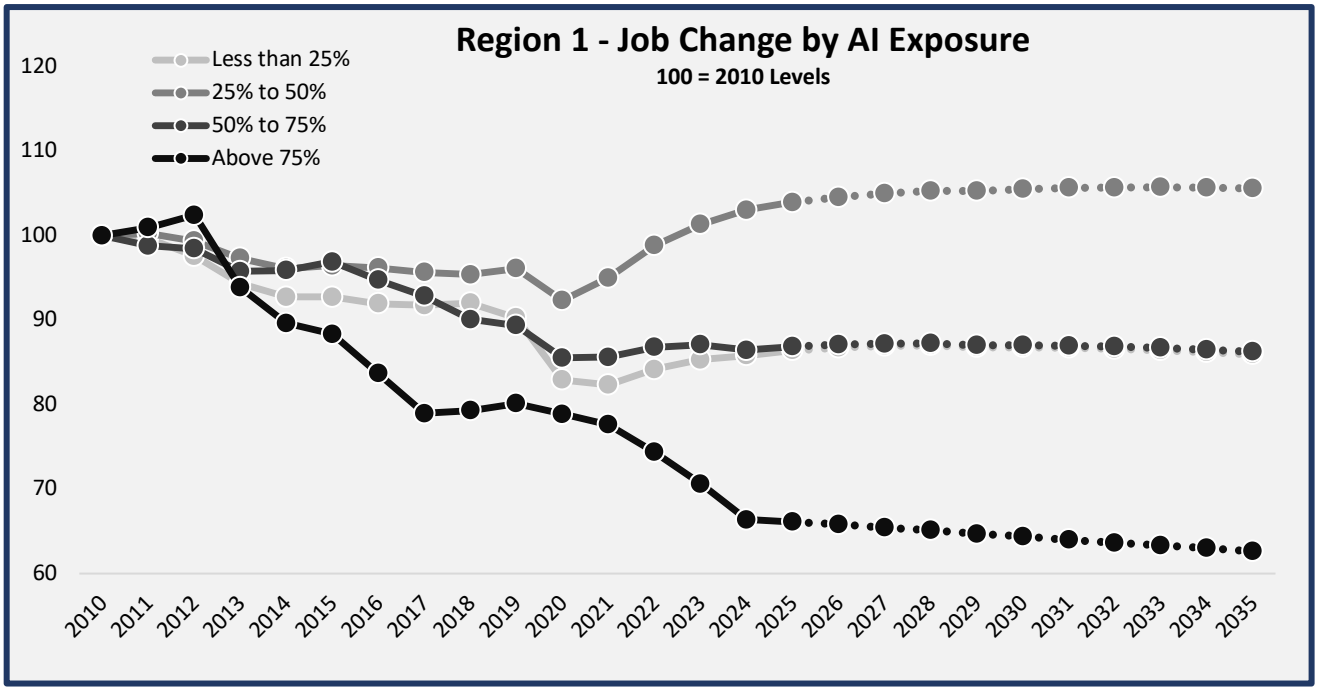
Appendix B – Regional Impact Forecasts

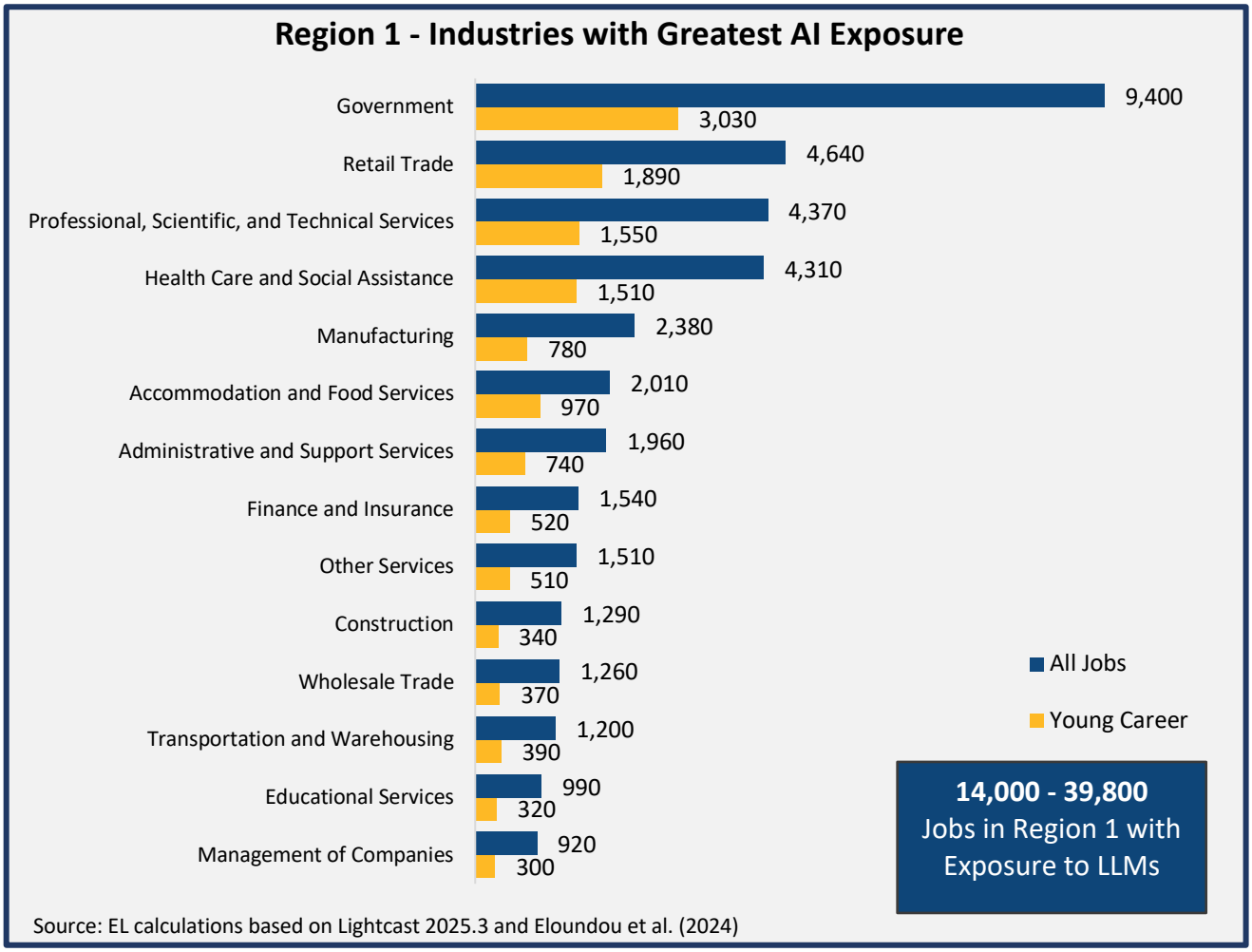
GO Virginia Region 1

Region 1 covers much of southwest Virginia, comprising of 13 counties and three independent cities (Bristol, Galax, and Norton). The region's economy has historically depended on coal mining and manufacturing. Today the region's target industries are advanced manufacturing, agriculture, food and beverage manufacturing, information and emerging technologies, and energy and minerals. About 14,000 jobs held by people under age 35 have AI exposure. This is 10.9 percent of all jobs in the region. Under the all-jobs scenario, about 39,800 jobs are exposed to AI, about 30.9 percent of total jobs. General managers, retail workers, and customer service representatives are the most exposed occupations. The public sector had the highest number of jobs with AI exposure. High exposure jobs have already been experiencing job declines in the region since 2012.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





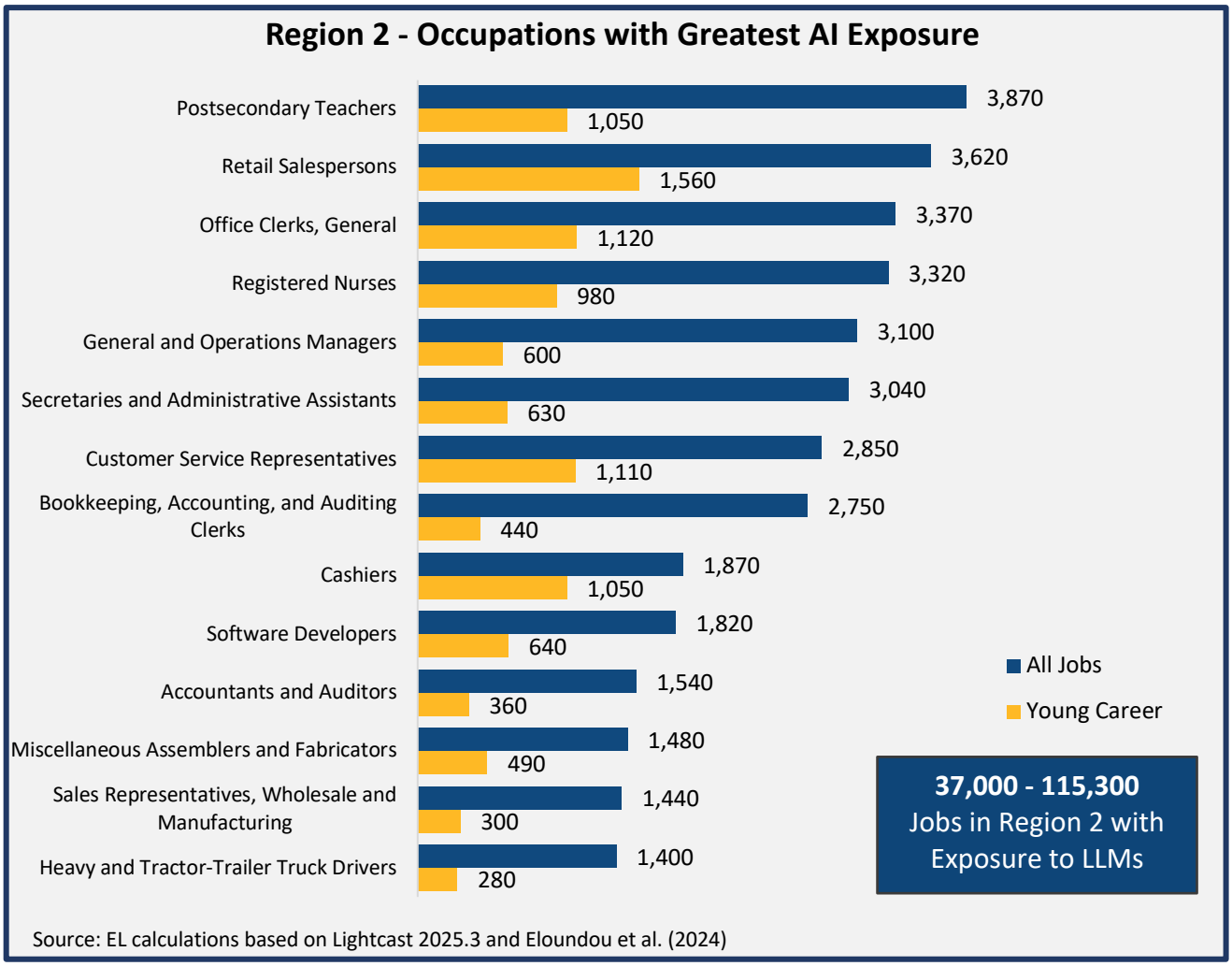
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

The recommendations in Section 5 related to upskilling and reskilling will be important in Region 1 given that so many of the region's projected occupational impacts are concentrated in administrative and retail-related occupations. AI has the potential of enhancing the productivity of some of Region 1's target sectors – advanced manufacturing, IT and energy, in particular – but a priority should be ensuring the workforce is AI literate to be able to capitalize on emerging opportunities. Recommendations for supporting small- and mid-sized businesses should be important for helping Region 1 businesses leverage the benefits of AI. Finally, as will be the case in every region, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be an important area of focus for regional leaders.

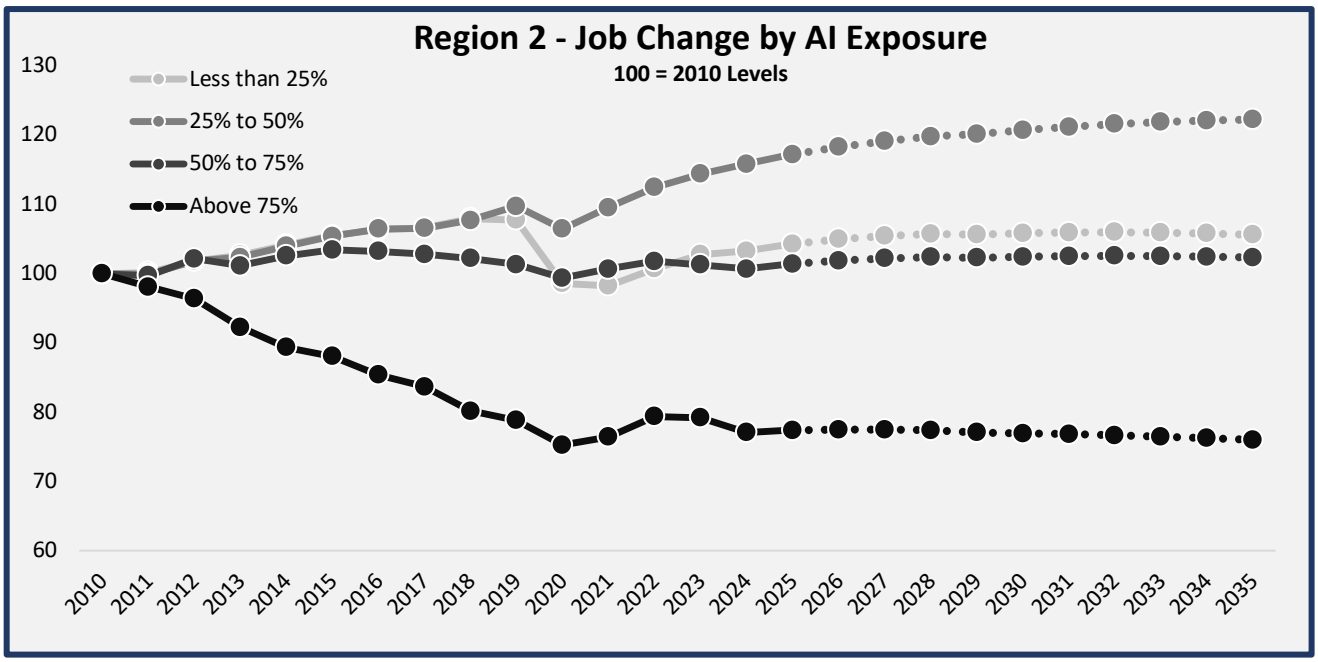
GO Virginia Region 2

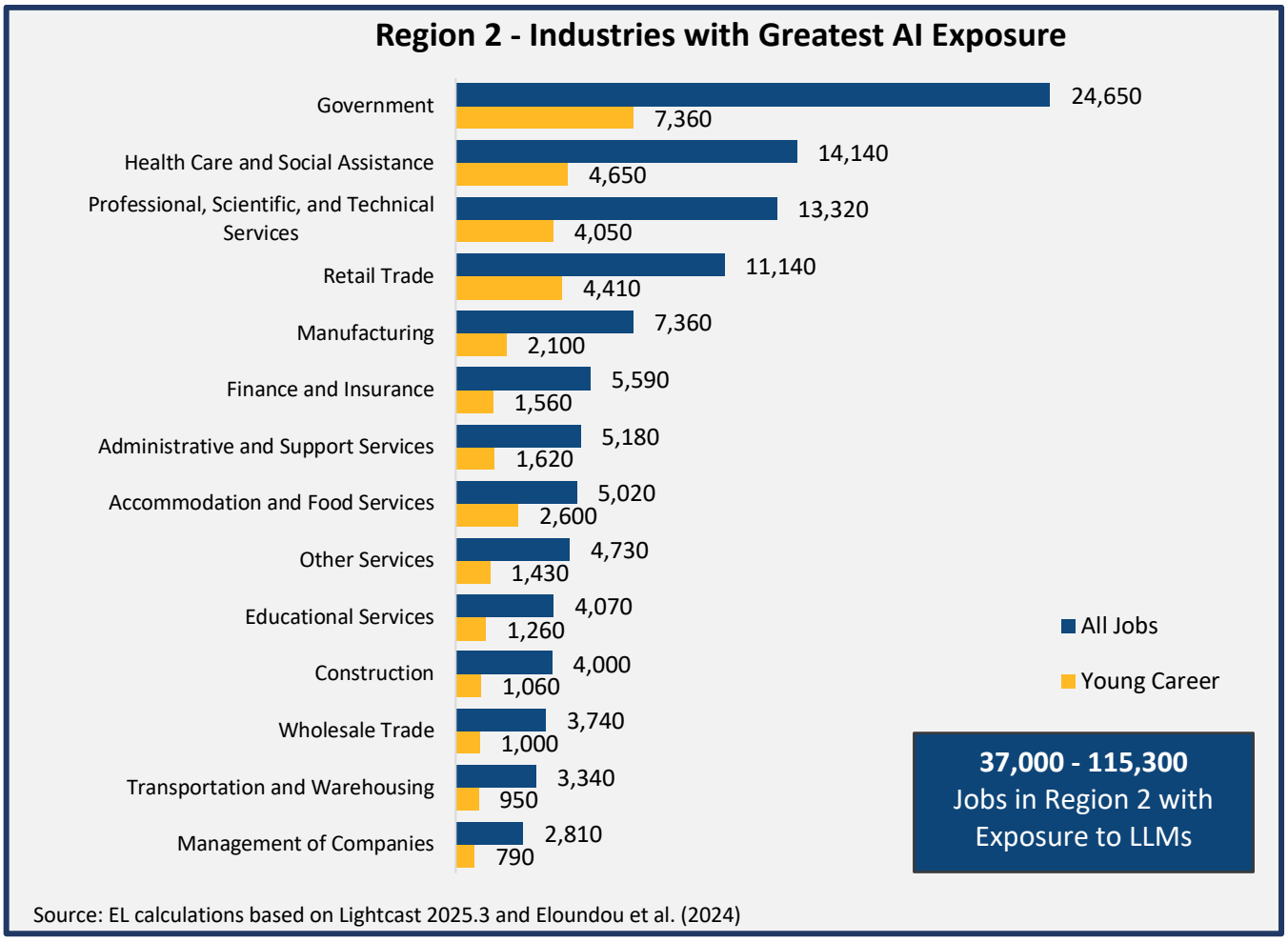
Region 2 spans the New River Valley, Roanoke Valley, and Lynchburg area in the Western portion of the state. The region's target industries are IT, engineering and emerging tech, life sciences and biotechnology, materials and machinery manufacturing, and transportation and autonomy manufacturing.

The region is home to many universities, as a result postsecondary teachers are among the top jobs in the region with AI exposure. Among the top occupations, there are a few blue-collar jobs like assemblers, fabricators, and truck drivers. Under the all-jobs scenario, about 115,300 jobs are exposed to AI, about 32.1 percent of total jobs. Healthcare, professional services, and manufacturing are among the top industries with jobs with AI exposure. Under the young career scenario, about 37,000 jobs have AI exposure or about 10.1 percent of all jobs in the region. Jobs with less AI exposure have already been experiencing the greatest job gains in the region.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





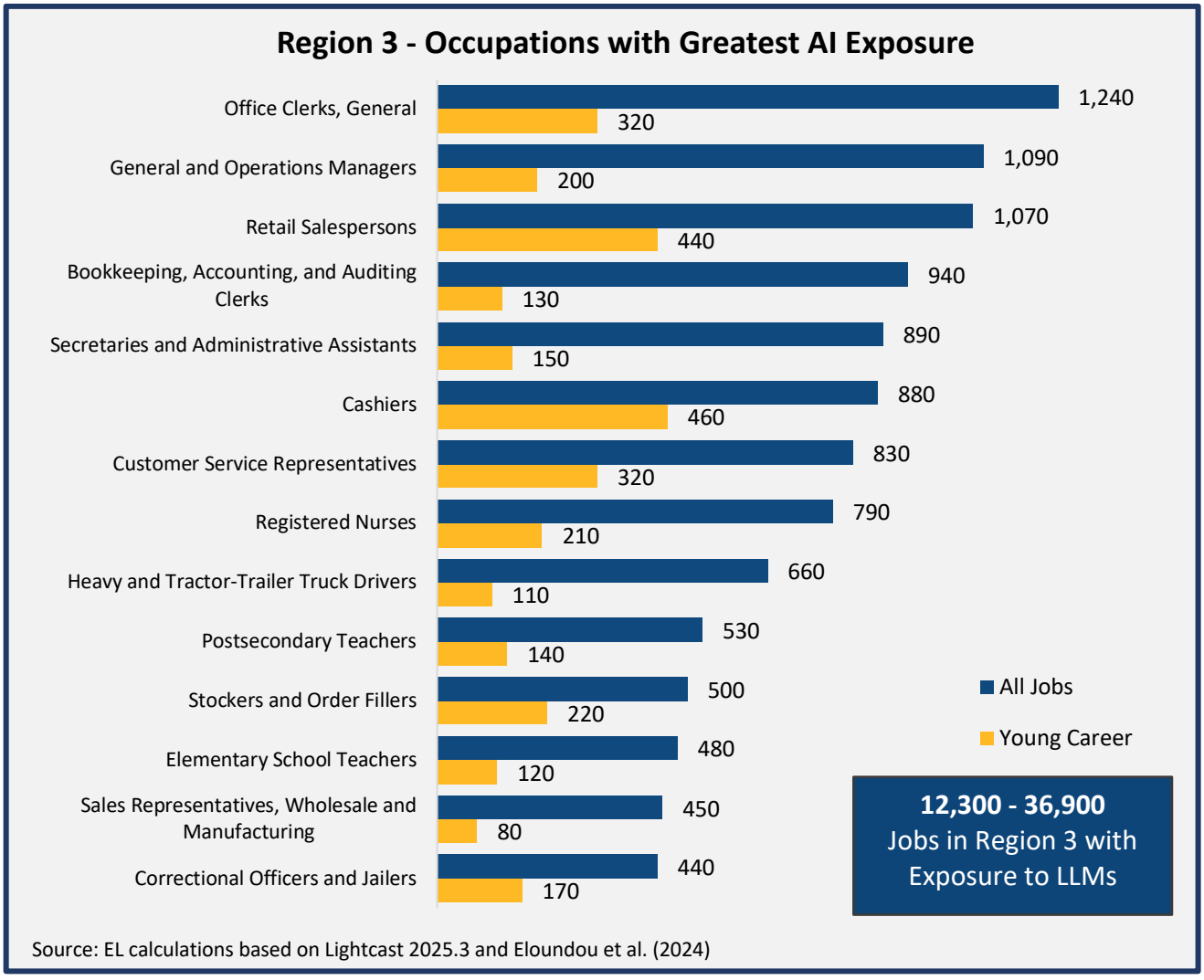
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

In Region 2, given the projected industry and occupational impacts, many of the K-12 and higher education-related recommendations in Section 5 should be prioritized within the region. Deployment of AI is likely to benefit the longer-term growth of all of the region's target sectors but recommendations from Section 5 related to upskilling and helping workers identify career transition pathways will be important in the near-term. Recommendations on ecosystem and investment support for early-stage AI ventures are also likely to be important in Region 2 given the level of research and innovation occurring at universities in the region. The specific recommendation about establishing a Virginia AI Center of Excellence involving multiple higher education institutions throughout the Commonwealth should be a priority in Region 2 as well. Finally, as in every region, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be an important area of focus for regional leaders.

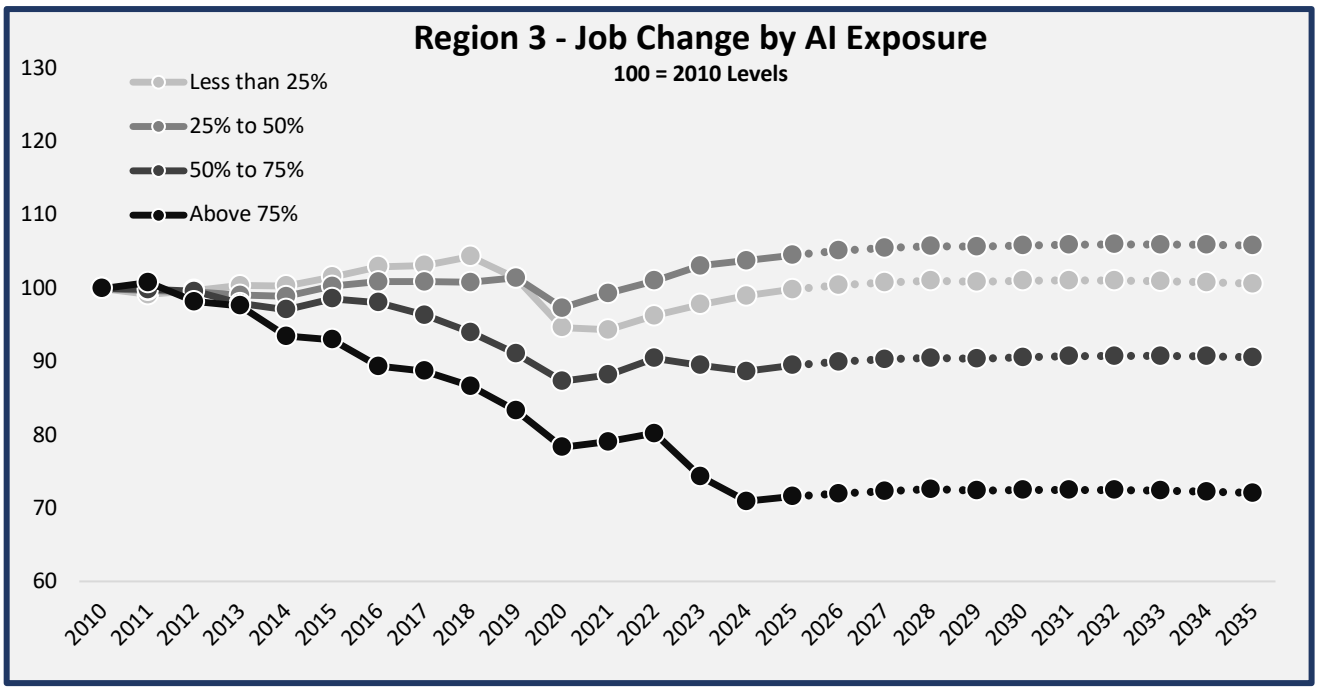
GO Virginia Region 3

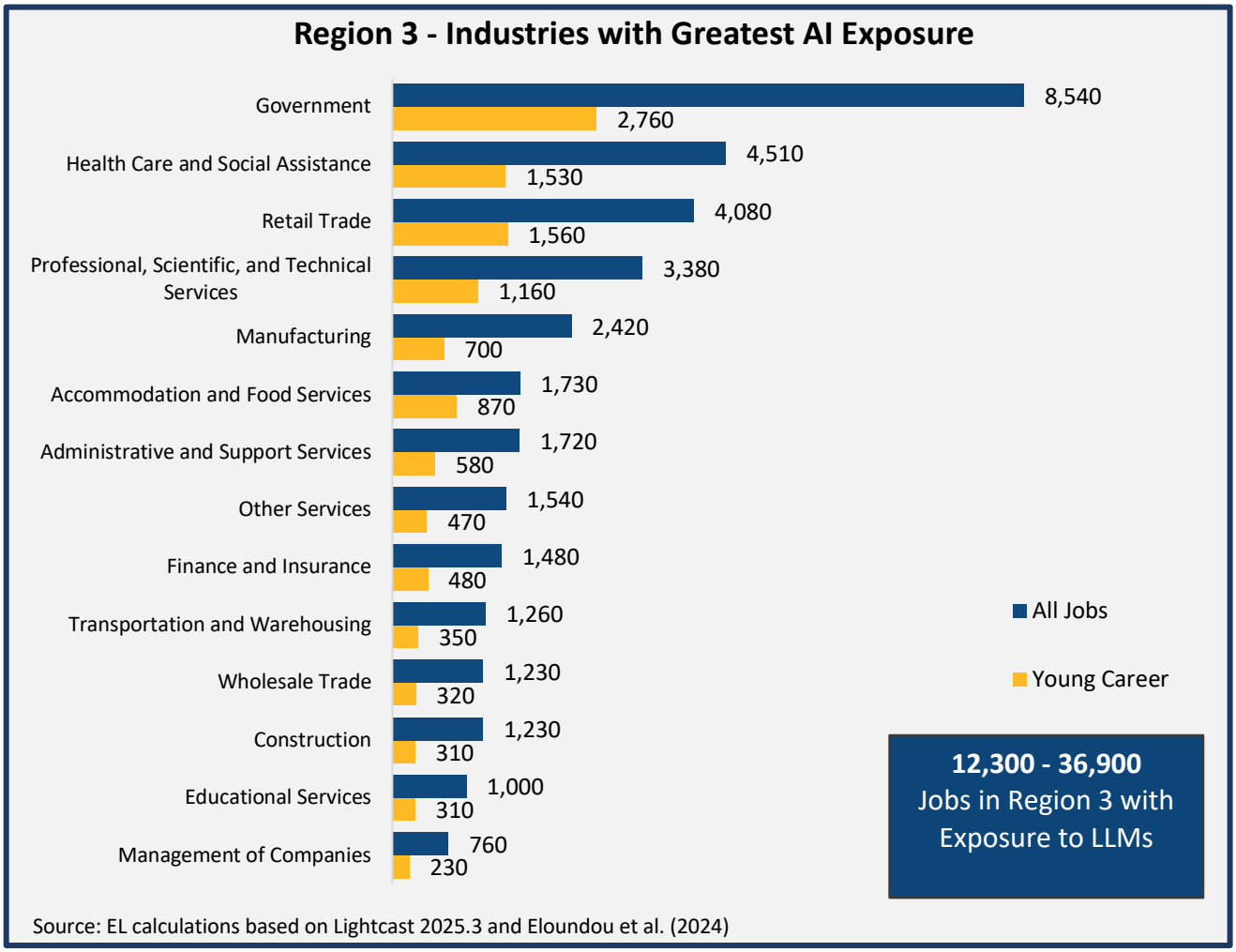
Region 3 encompasses the Southside, including the cities of Danville and Martinsville. The economies of these communities are in transition from legacy industries of textiles, furniture, and tobacco. The region's target industries now are focused on advanced manufacturing, healthcare, and IT/data centers.

The occupation with the most jobs with AI exposure is white collar administrative support jobs like secretaries. Under the all-jobs scenario, about 36,900 jobs are exposed to AI, representing about 29.1 percent of total jobs. Healthcare, retail trade, professional services, and manufacturing are among the top industries with jobs with AI exposure. Under the young career scenario, about 12,300 jobs have AI exposure or about 9.7 percent of all jobs in the region. Young professionals exposed to AI are most prevalent in the retail and food service industries. Jobs with the highest AI exposure have already been experiencing the greatest job losses in the region, with a noticeable fall after 2022.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





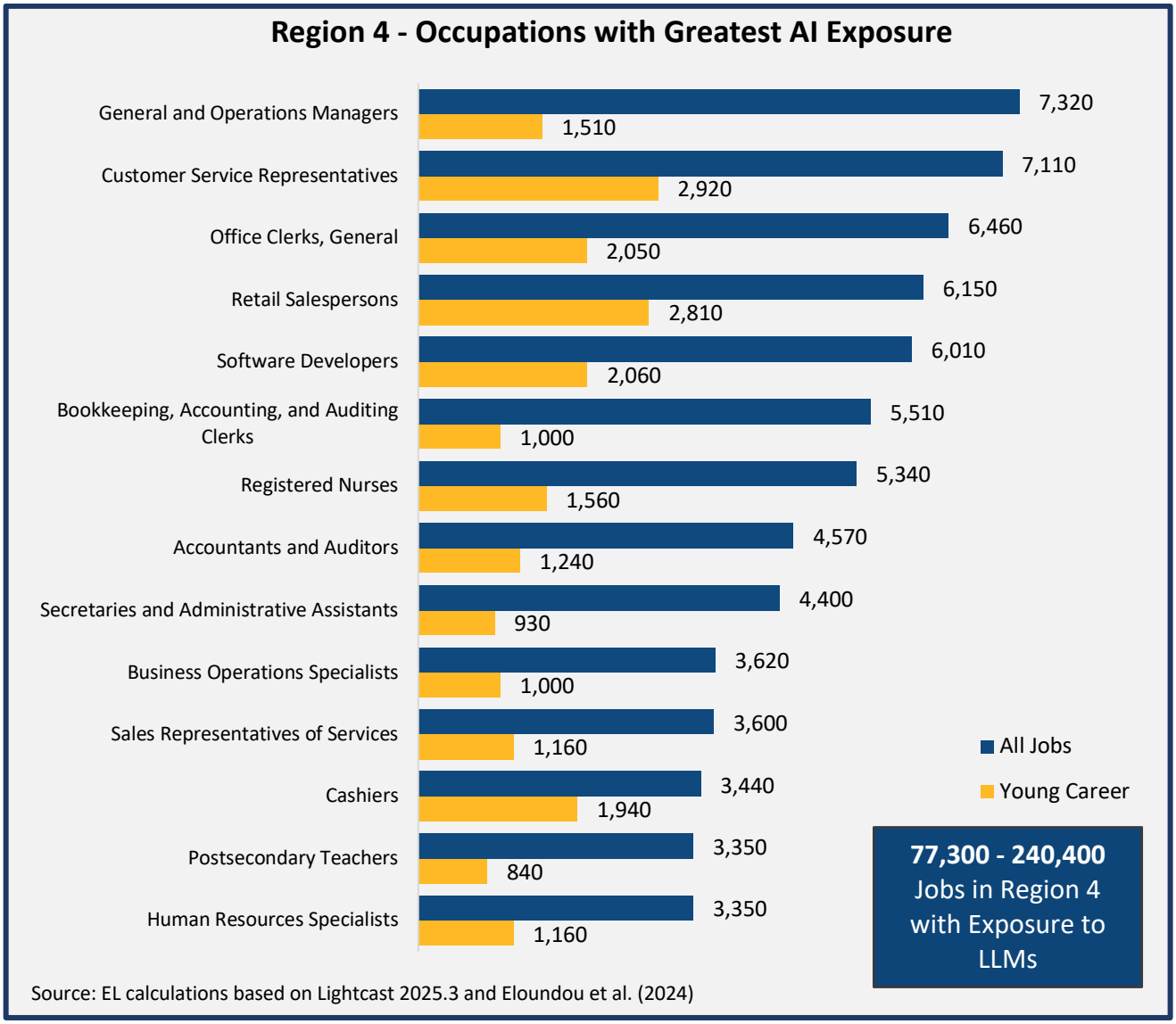
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

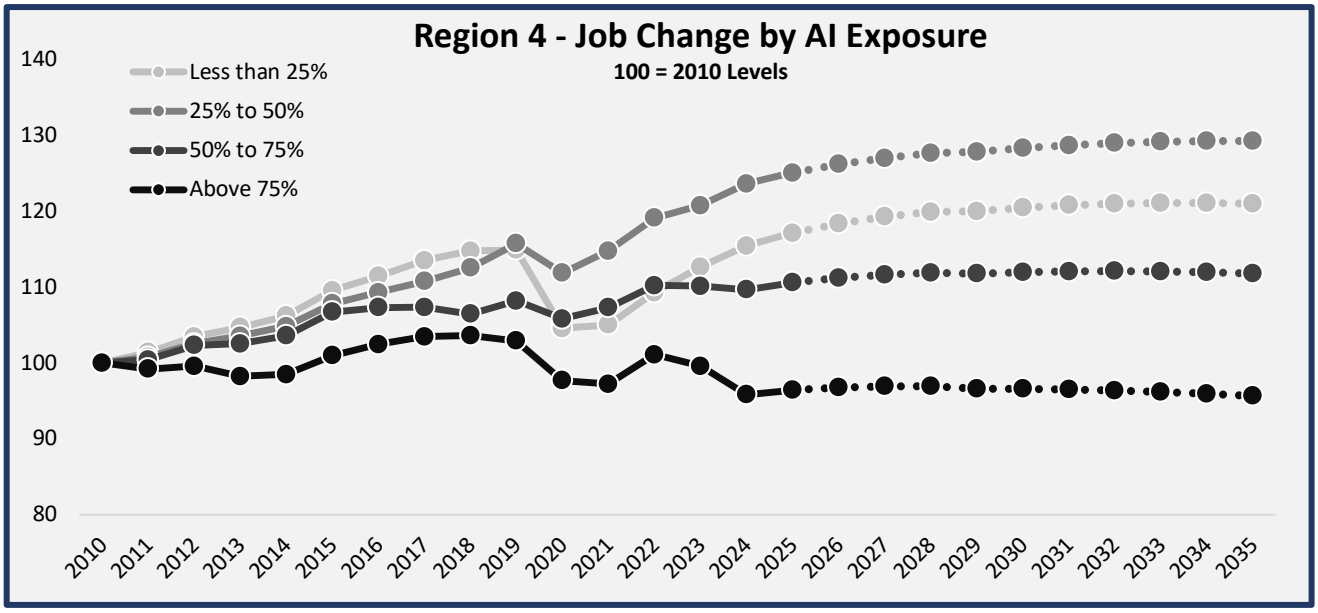
Region 3 should prioritize recommendations in Section 5 that are focused on upskilling and reskilling given the large number of potentially impacted workers in administrative and service-related occupations. When fully deployed, AI tools and agents should help enhance the growth and development of Region 3's target industries. AI-related training and AI literacy should be emphasized to prepare the workforce for emerging opportunities in the region. In particular, preparing the advanced manufacturing workforce to capitalize on AI opportunities is important. Recommendations related to AI training and technical assistance resources for small- to mid-sized businesses should be prioritized in Region 3. Finally, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be a prioritized area of focus for regional leaders.

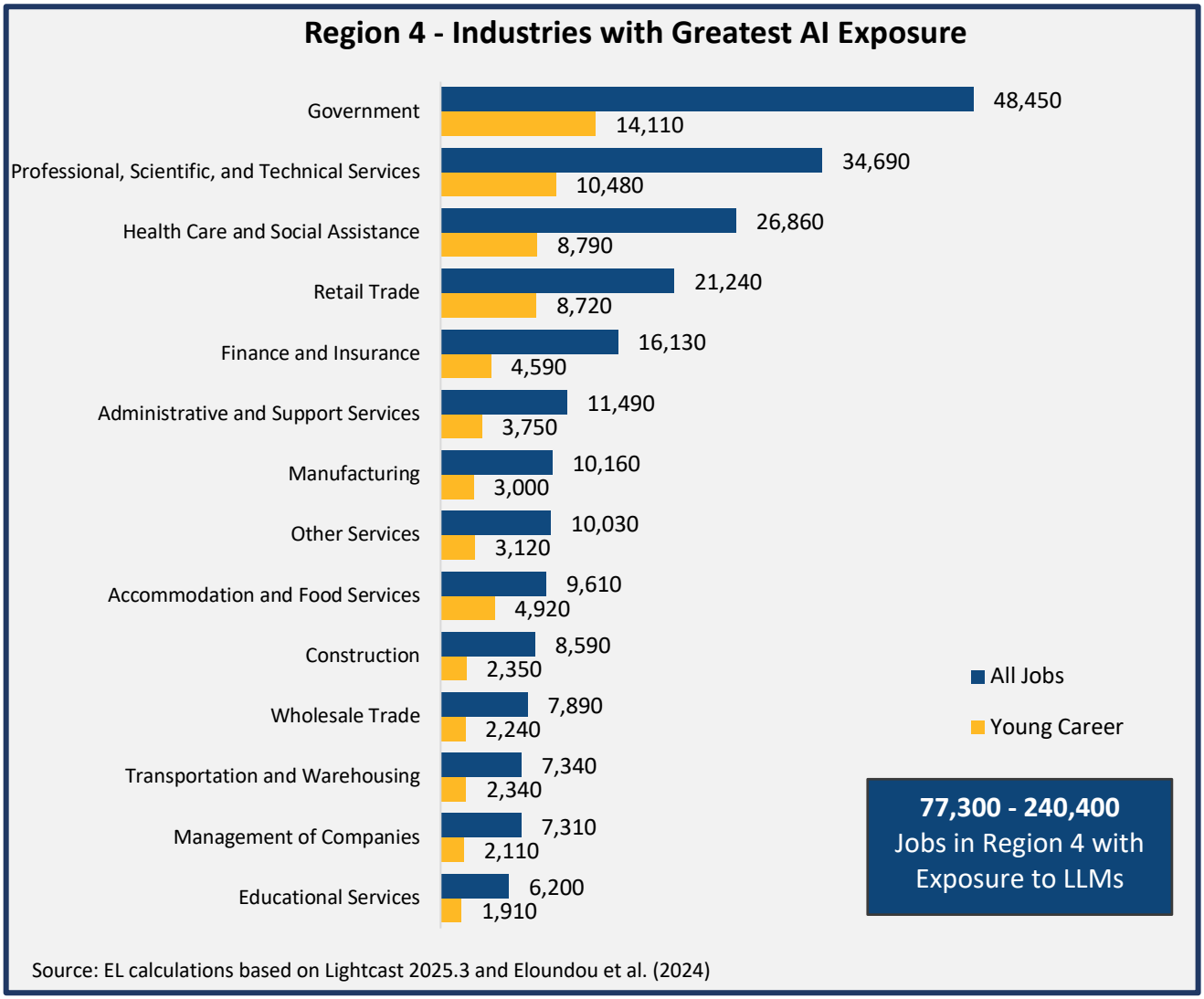
GO Virginia Region 4

GO Virginia Region 4 covers the Greater Richmond area of central Virginia. In addition to hosting the state government, the region's economy includes advanced manufacturing, life sciences and biosciences, IT and emerging technologies, and logistics as its target sectors.

The region employs many knowledge workers, as a result occupations like software developers, accountants, and operations managers are among the most impacted by AI. Under the all-jobs scenario, about 240,000 jobs are exposed to AI, about 34.3 percent of total jobs. Government, professional services, and the healthcare industry are the sectors with the most jobs exposed to AI in the region. Under the young career scenario, about 77,300 jobs have AI exposure or about 11 percent of all jobs in the region. Job gains with the highest AI exposure have been stagnant in the region while less exposed positions have experienced strong growth.







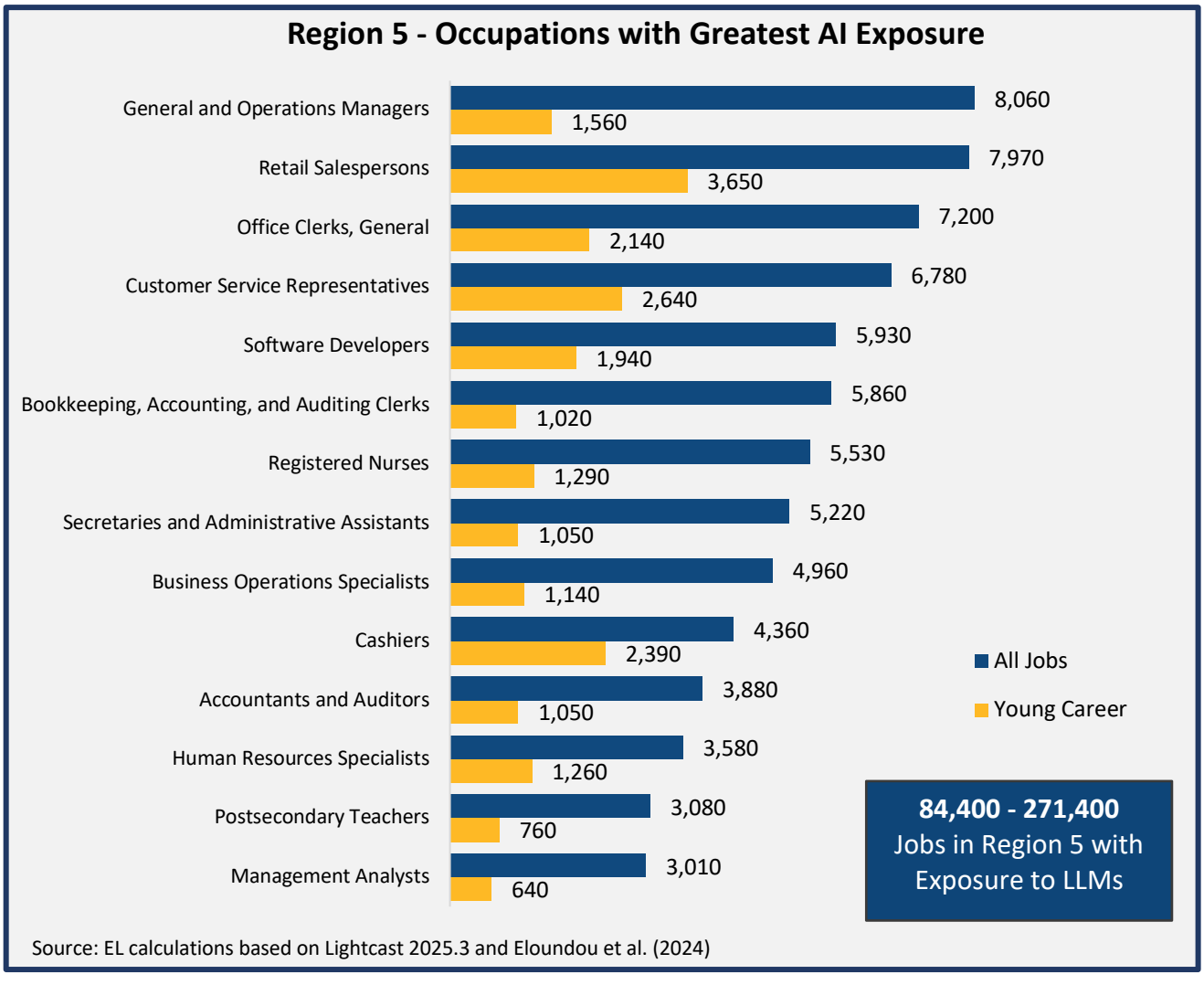
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

For Region 4, given the projected industry and occupational impacts, many of the K-12 and higher ed-related recommendations in Section 5 should be prioritized within the region. All of Region 4's target sectors can benefit from AI-related process and product development efficiencies but sector-specific training and support is needed to help companies deploy AI effectively. In particular, AI-workforce preparedness will be important for life sciences and biosciences sector development in Region 4. The recommendations on resources and ecosystem support for early-stage AI ventures are also likely to be important in Region 4 given the strong AI ecosystem that already exists. Recommendations related to marketing Virginia's capabilities as an AI hub would play to the infrastructure and workforce strengths that exist in the Region 4 (as well as in Region 5 as outlined in the RVA757 vision). Region 4 has a strong head start in convening regional partners thanks to AI Ready RVA's work highlighting AI-related workforce development and business opportunities.

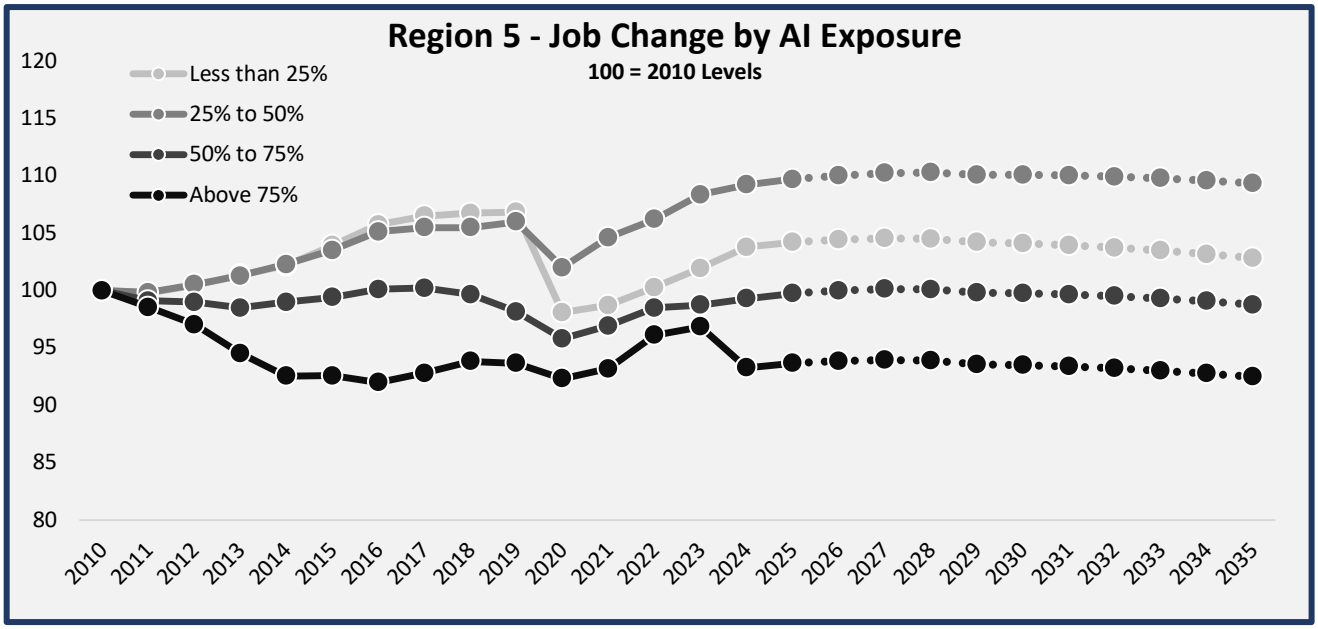
GO Virginia Region 5

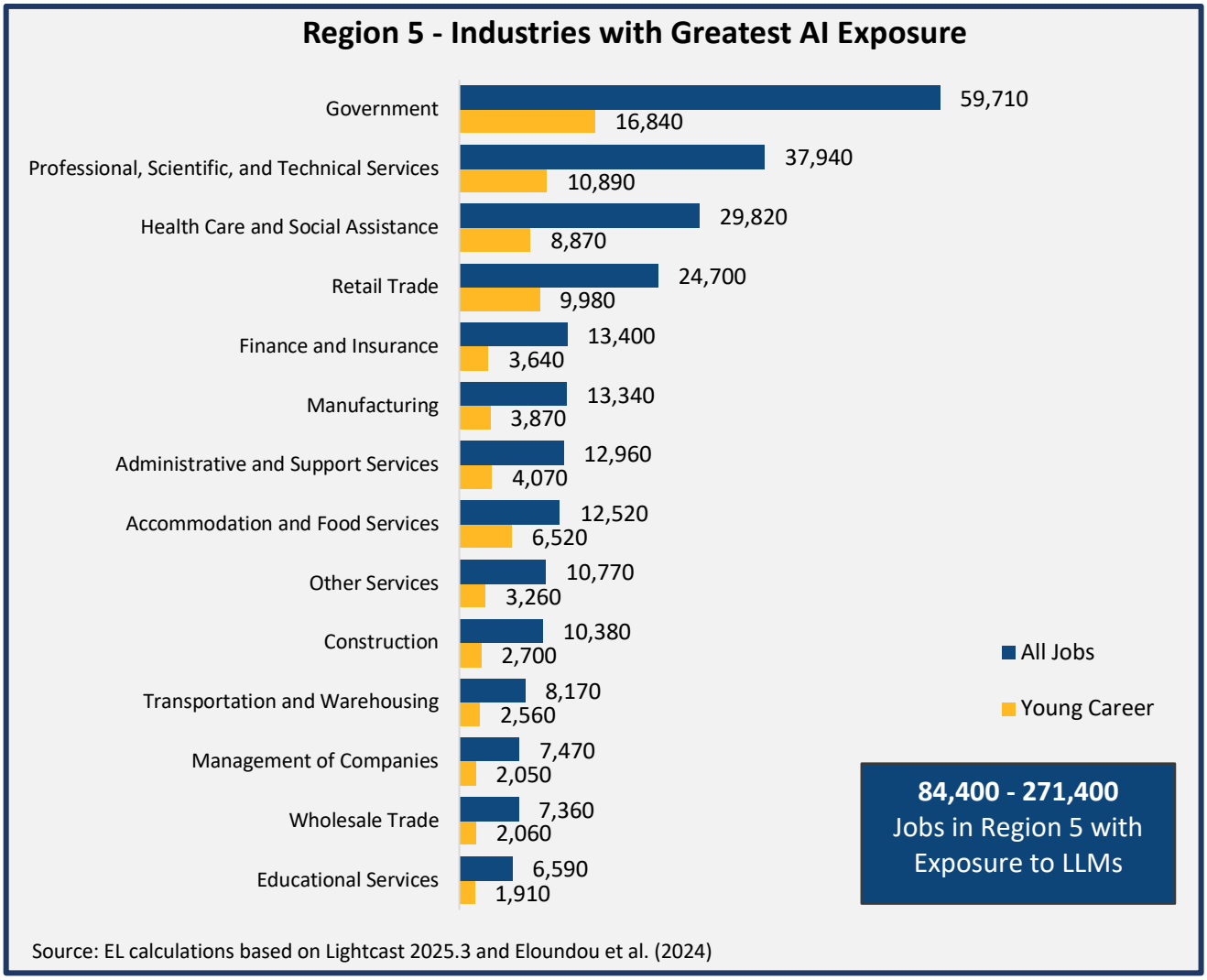
Region 5 contains the Hampton Roads area including the cities of Norfolk, Virginia Beach, and Newport News. This region has some unique assets like a major port, military bases, and one of the country's first large-scale offshore wind farms. These assets translate into the region's distinctive target sectors of clean energy, cybersecurity, logistics, shipbuilding, water technologies, unmanned systems, and advanced manufacturing.

The region is also a tourism destination; therefore, there are many young careers like retail salespersons and cashiers with high exposure. Under young career scenario, about 84,400 jobs are exposed to AI, about 9.9 percent of all jobs. The region employs many admin support and education workers that are among the highest exposures. Under the all-jobs scenario, about 271,400 jobs have AI exposure or about 31.9 percent of all jobs in the region. Jobs with the highest AI exposure saw a large decline from 2023 to 2024.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

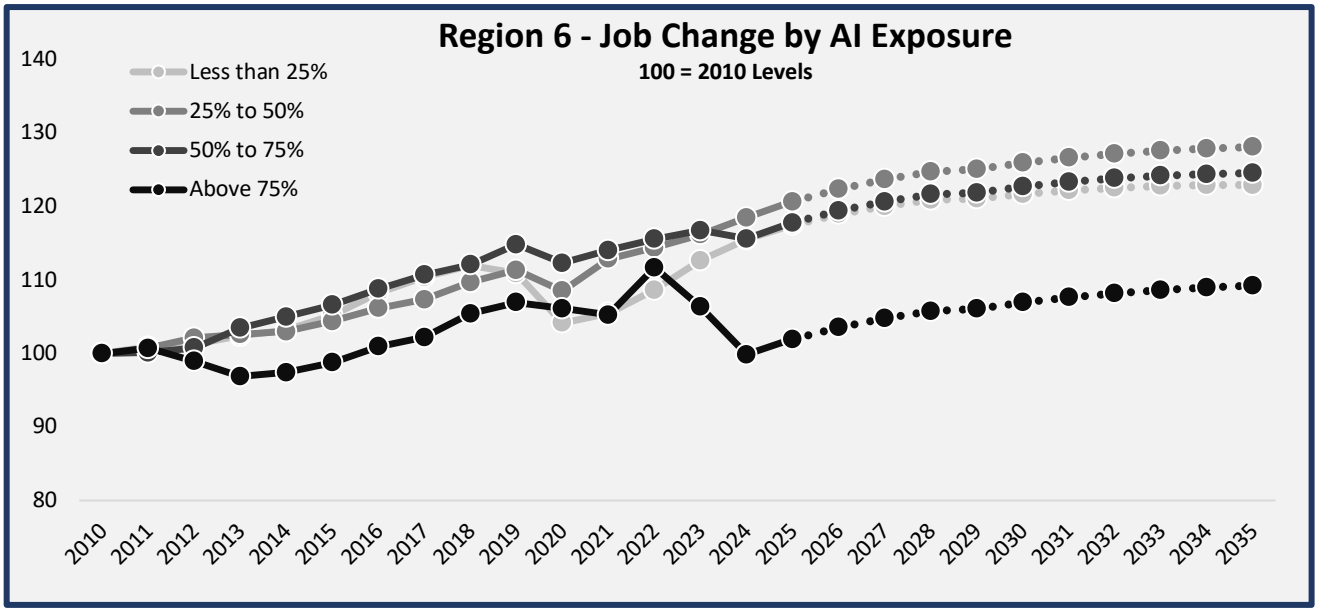
As the GO Virginia region with the second largest number of potentially impacted businesses and workers, nearly of all of the recommendations outlined in Section 5 will be important for Region 5. All of Region 5's target sectors can benefit from AI-related process and product development efficiencies but sector-specific training and support is needed to help companies deploy AI effectively. AI workforce training for the region's advanced manufacturing and shipbuilding sectors should be prioritized to capitalize on opportunities in these large and growing sectors. Additionally, many service and hospitality workers in the region will need assistance in identifying transferrable skill pathways and reskilling resources. Providing training for managers to deploy AI tools and resources will be beneficial for the many defense contractors and other established firms in the region. Recommendations to market Virginia's capabilities as an AI hub would leverage the region's infrastructure and workforce strengths (and those of Region 4, as outlined in the RVA757 vision). Finally, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be an important area of focus for regional leaders.

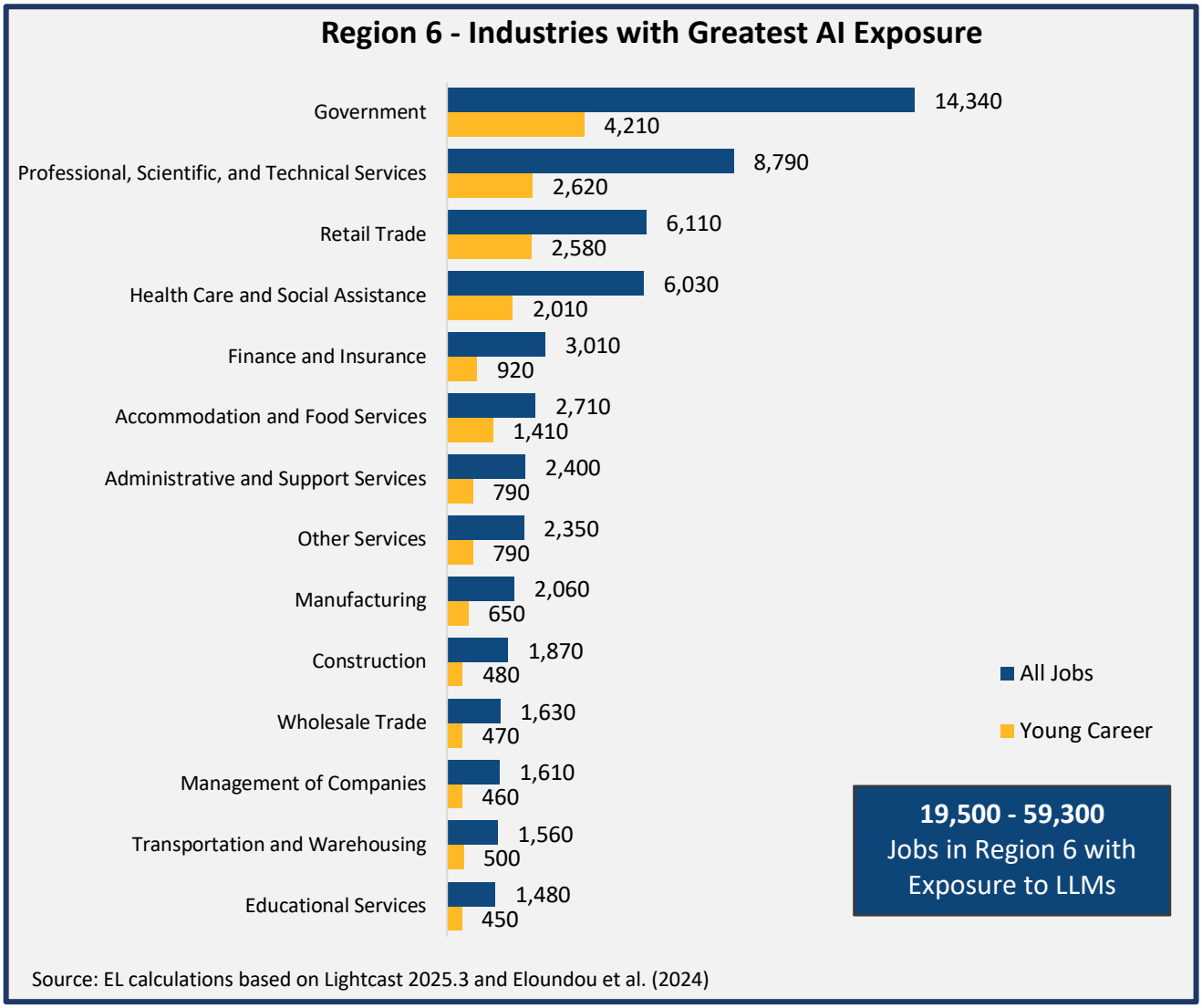
GO Virginia Region 6

Region 6 includes the Middle Peninsula, Northern Neck, and Fredericksburg areas. The surrounding rivers that led into the Chesapeake Bay and proximity to major transportation corridors help shape the target sectors of the region. These sectors include aquaculture, commercial fishing, seafood processing, logistics and distribution, and advanced manufacturing.

The occupations with the greatest levels of AI exposure include some high wage knowledge-based jobs like management analysts, operations managers, and project managers. The analysis of all-jobs found that about 59,300 jobs have AI exposure or about 33.8 percent of the region's total. Under the young career scenario, about 19,500 jobs are exposed to AI, about 11.1 percent of all jobs. Unlike other regions, Region 6 was adding jobs with the highest AI exposure. Since 2022 these jobs have declined in the region with a small rebound in the last year.

Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





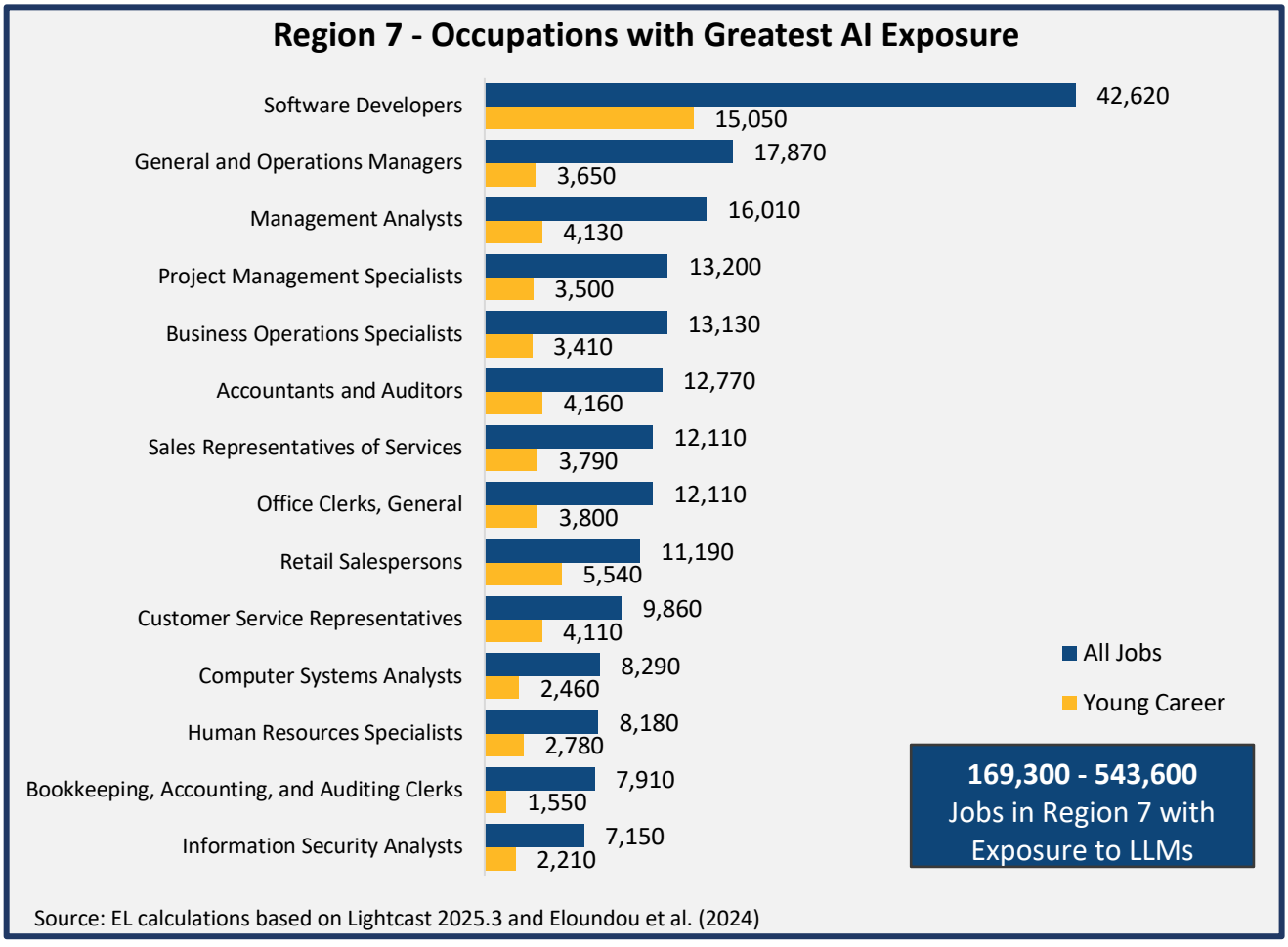
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

In Region 6, recommendations in Section 5 related to upskilling and reskilling will be important given that so many of projected occupational impacts are concentrated in retail and administrative occupations. Preparing the advanced manufacturing and transportation/logistics workforce to capitalize on AI opportunities will be important for advancing these sectors in this region. While some of the other target sectors in Region 6 may be less affected by AI-related workforce issues, recommendations related to small- and mid-sized business support should also be top priorities for helping Region 6 businesses optimize the impacts of AI. Finally, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be an important area of focus for regional leaders.

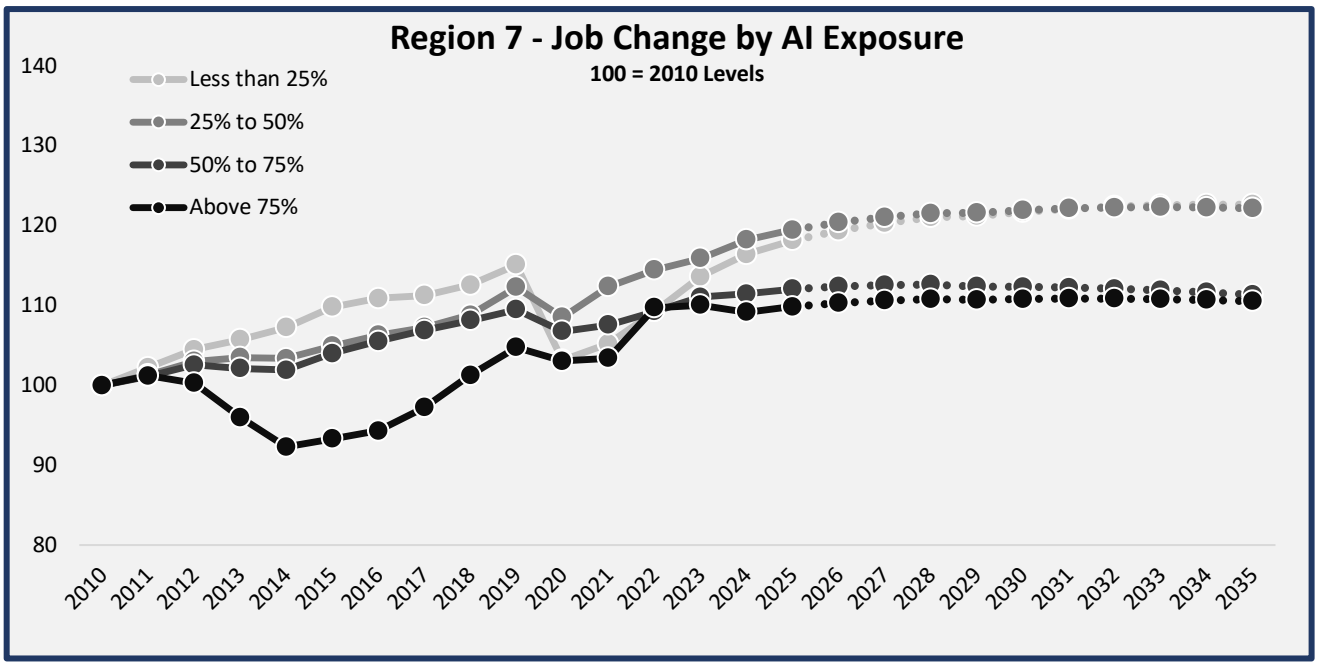
GO Virginia Region 7

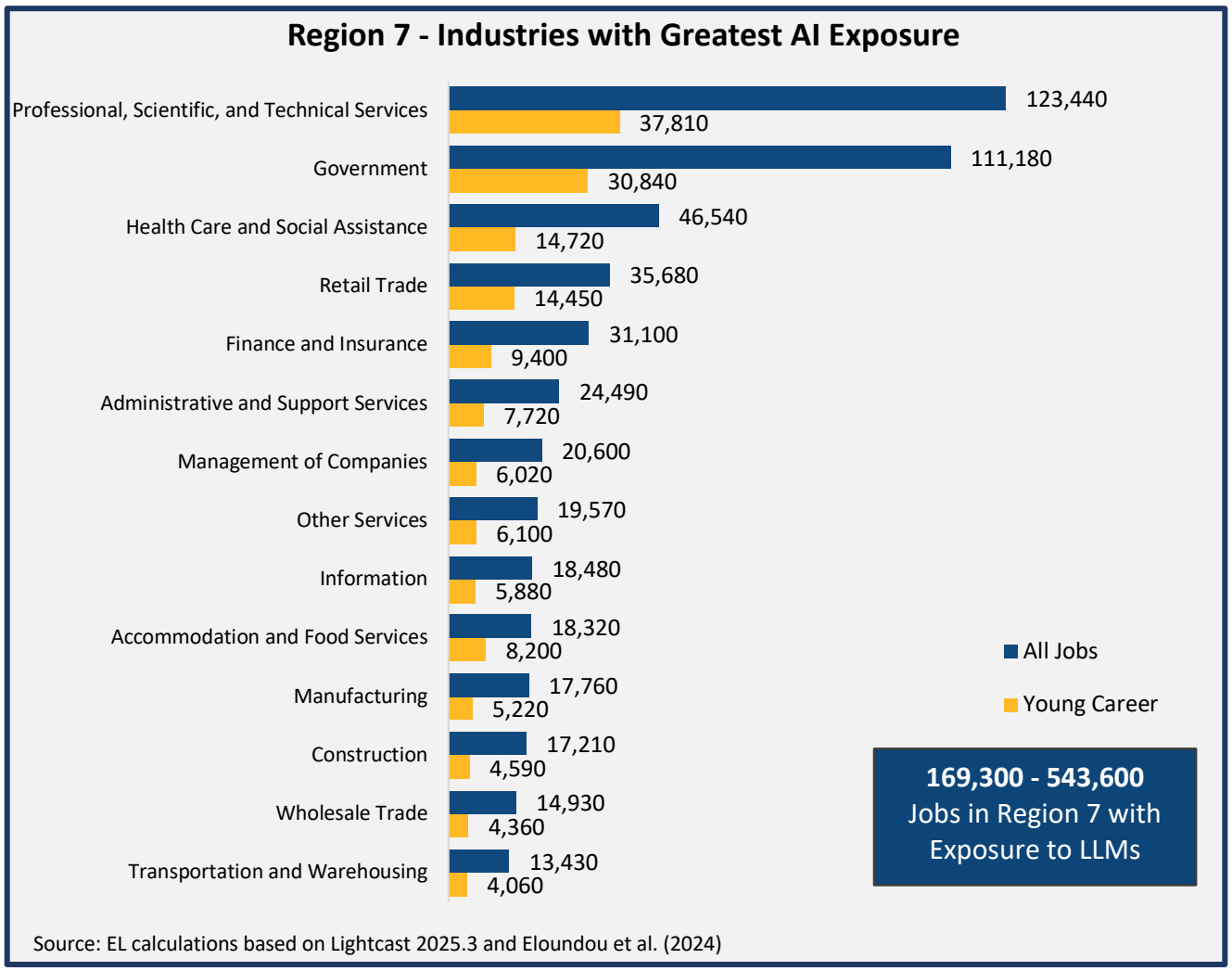
This region contains the Northern portion of the state, located just outside of Washington, DC. Region 7 leads the state in total employment and highest median income. The region's economy is driven by federal contracting in a variety of fields. The region's target sectors include computer software, cybersecurity, engineering services, research organizations, life sciences, and emerging technologies.

The top occupations list of Region 7 differs from those of other regions in the state. Some of the occupations with the most AI exposure in the region are in more advanced knowledge-based roles like software developers, information security analysts, and computer system analysts rather than clerical positions. The analysis of all jobs found that about 543,600 jobs have AI exposure. This was double the exposure level as any other region in the state. These AI-exposed jobs account for about 39 percent of the region's total. Under young career scenario, about 169,300 jobs are exposed to AI, about 12 percent of all jobs. Jobs across all exposure levels have been growing in Region 7, however since 2022 job gains have been slower in the two highest exposure groups.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





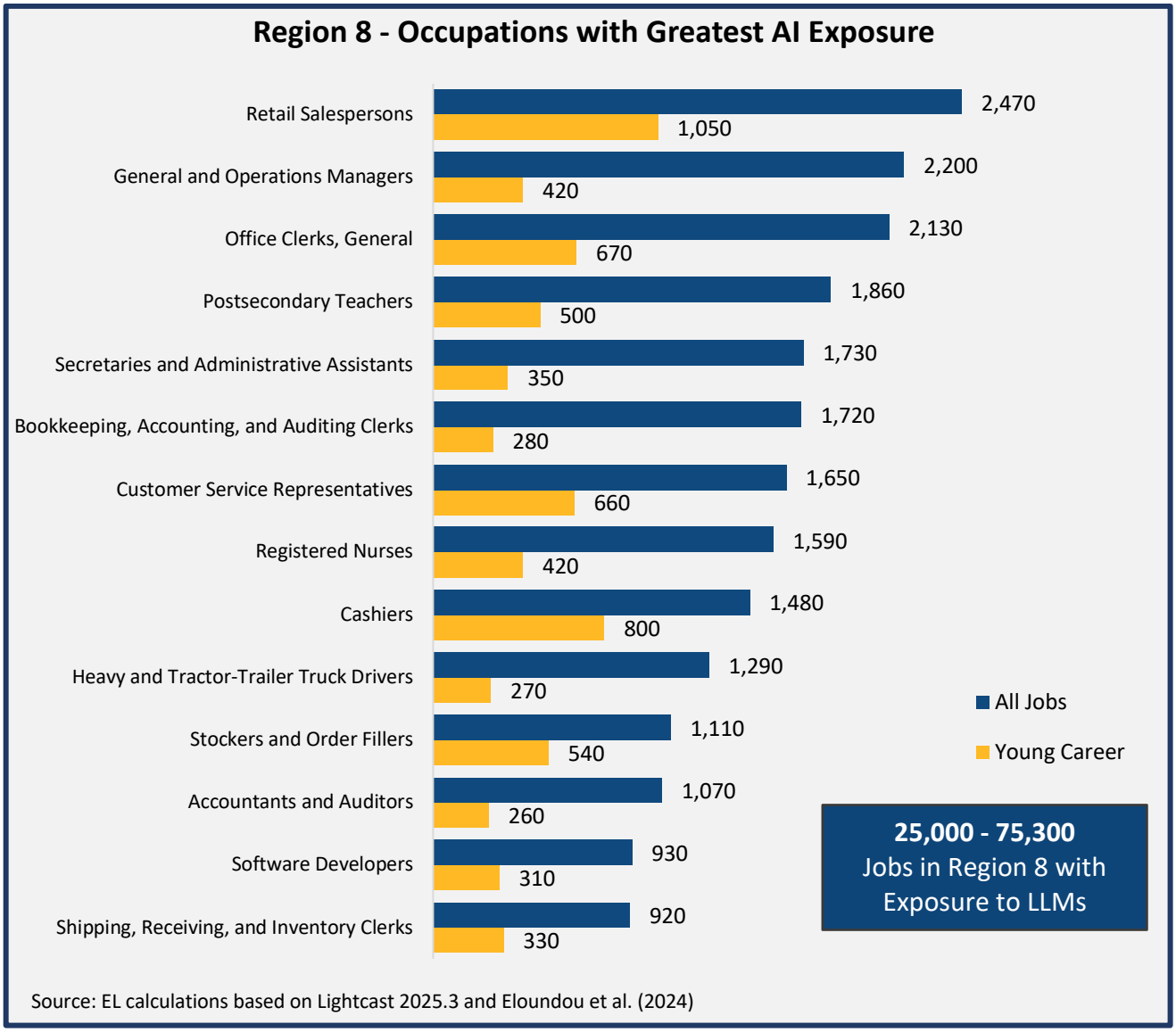
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

Of all GO Virginia regions, the opportunities and potential impacts from AI are likely to be greatest in Region 7. In sheer numbers, up to one-half million workers could have their jobs affected in some way by the deployment of AI tools and technologies. While AI has the potential to support and enhance all of Region 7's target sectors, given the scale of the potential impacts on specific occupations it will be essential to implement many if not all of the recommendations in Section 5. Also because of the number of impacted workers and firms involved, having resources and training to support displaced workers will be especially important. Support for Region 7 businesses to implement AI tools and technology and providing training for managers to deploy AI tools and resources will be critical. Additional ecosystem support resources, capital and infrastructure will be needed to support the growth and attraction of AI-related businesses in Region 7.

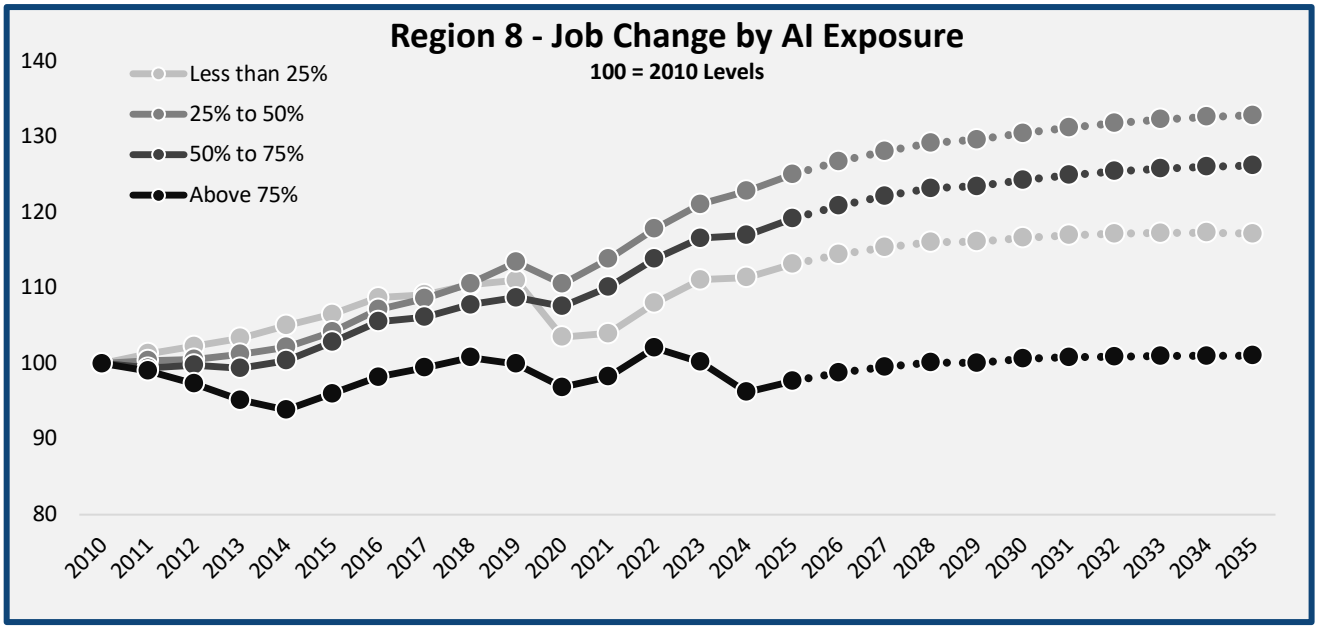
GO Virginia Region 8

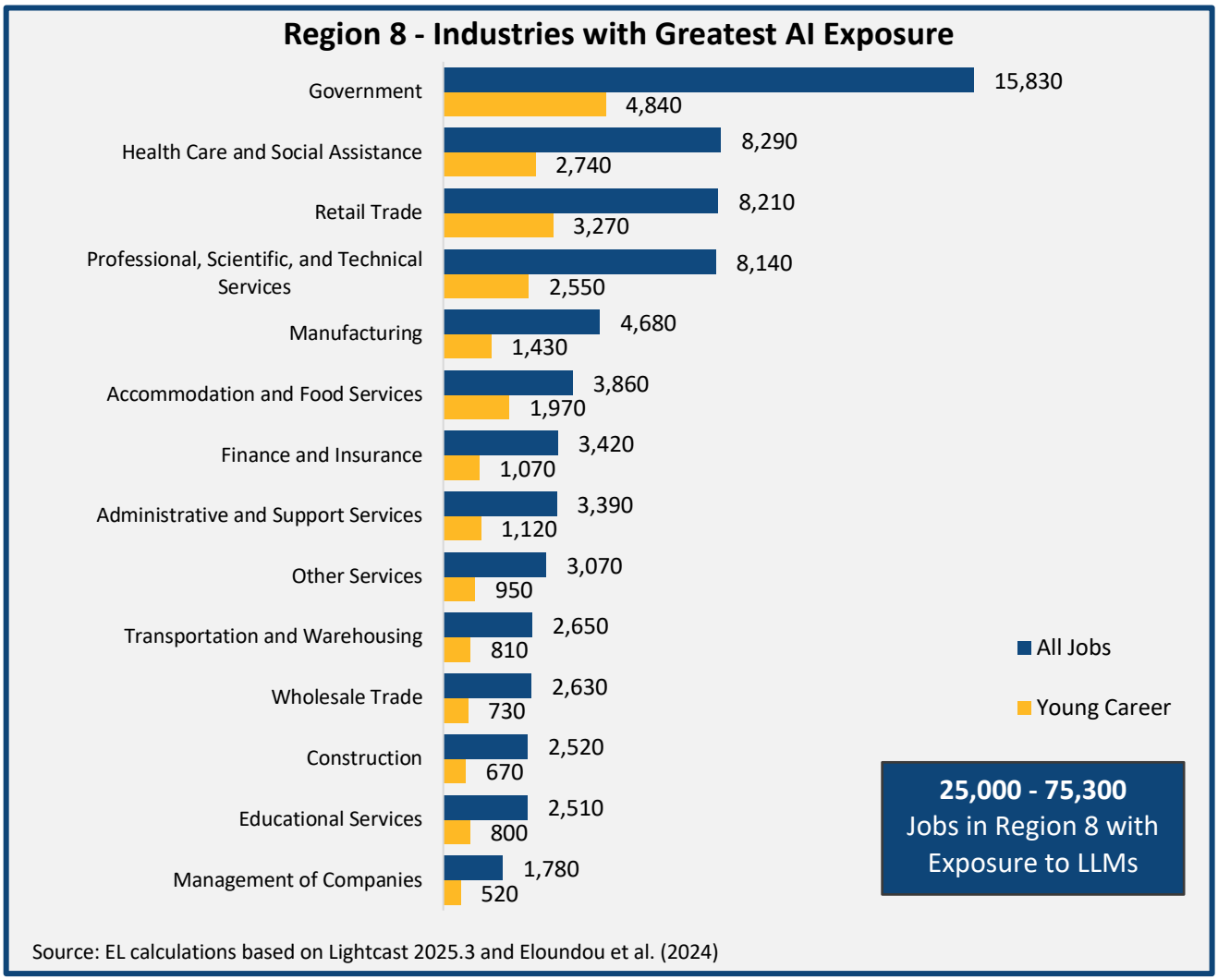
Region 8 covers the northern Shenandoah Valley portion of the state, including the independent cities of Winchester, Harrisonburg, and Staunton. The region has a diverse economy with target sectors that range from value-added food manufacturing, biomedical sciences, financial service, transportation and logistics, and light manufacturing.

The economy's diversity is reflected in the occupations with the highest levels of AI exposure. These occupations range from educators, nurses, administrative personnel, truck drivers, and shipping clerks. In the-all jobs scenario about 75,300 jobs have AI exposure or about 30.4 percent of the region's total. Under young career scenario, about 25,000 jobs are exposed to AI, about 10.1 percent of all jobs. Manufacturing is among the top industries affected. Job growth has been strong in the region, although the highest exposed jobs have been declining in recent years.



Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)





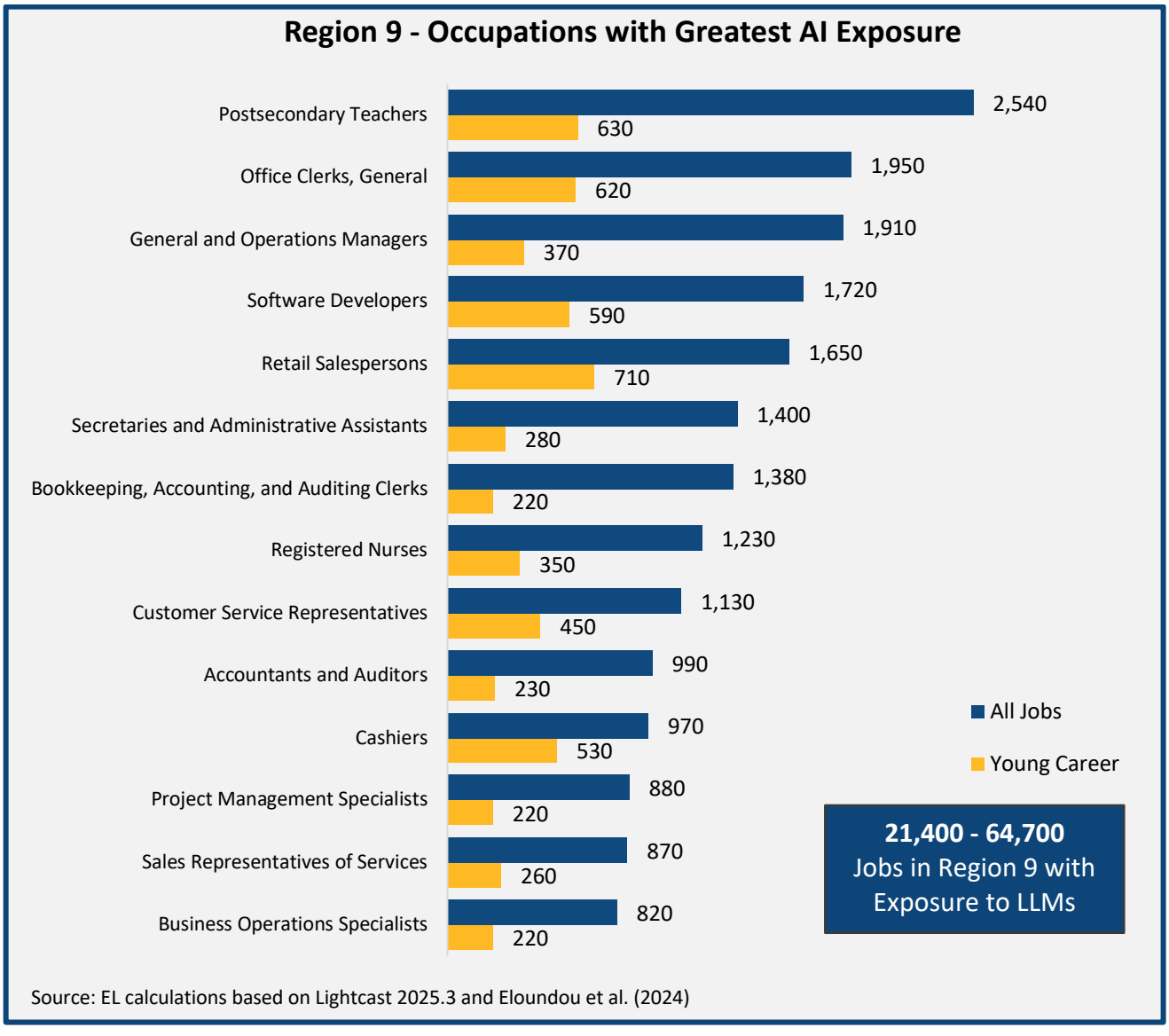
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

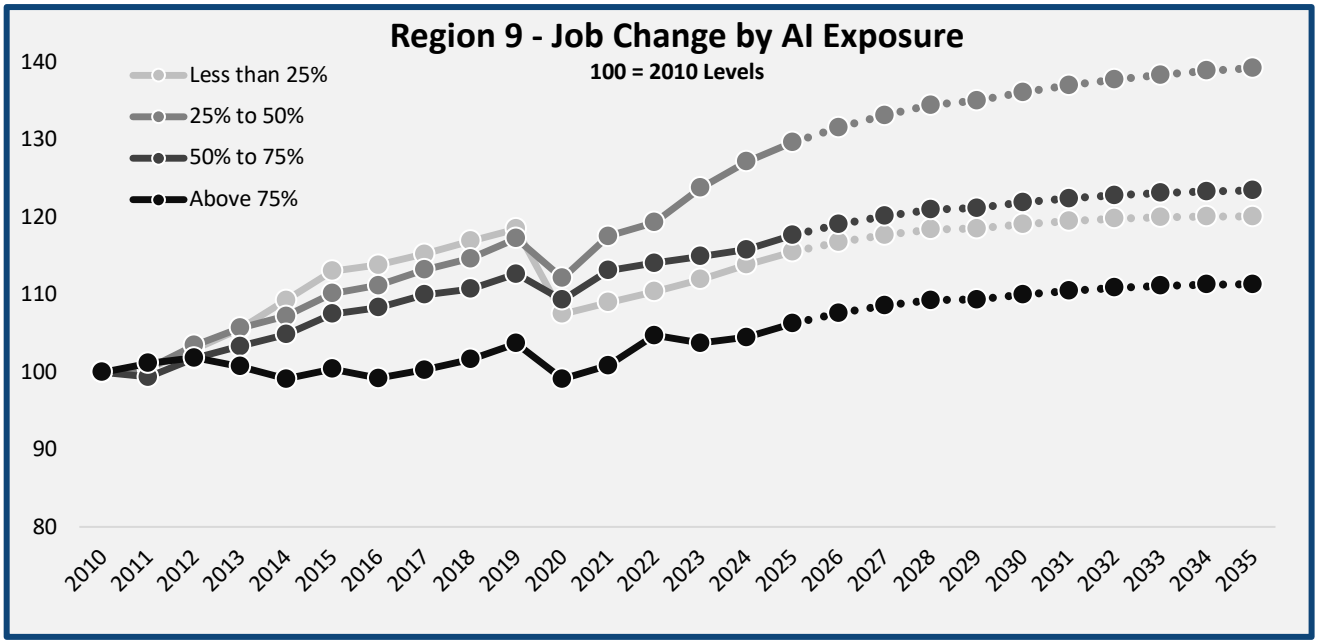
For Region 8, given the projected industry and occupational impacts, recommendations in Section 5 related to supporting businesses in the region – especially small- and medium-sized companies – to be able to capitalize on AI opportunities will be especially important. While AI has the potential of creating efficiencies and opportunities in many of the region's target sectors such as biomedical, transportation and logistics and even food and light manufacturing, it also can result in workforce impacts that will need to be addressed through a number of the upskilling and reskilling recommendations. Finally, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be an important area of focus for regional leaders.

GO Virginia Region 9

This region includes the greater Charlottesville area and encompasses most of the central piedmont. Much of the region's economy is anchored by the University of Virginia (UVA) and the innovation it generates. The target sectors for the area are financial services, IT, biomedical science, healthcare, value-add food products, and light manufacturing.

The prominence of UVA is evident among postsecondary teachers and government, the occupations and industries with the highest AI exposure in the region. In the all jobs scenario about 64,700 jobs have AI exposure or about 33.8 percent of the region's total. Under young career scenario, about 21,400 jobs are exposed to AI, about 11.2 percent of all jobs. Job growth has been strong in the region; the highest-exposure group has not dipped as dramatically after 2022 as in some other regions in the state.




Region 9 - Job Change by AI Exposure
100 = 2010 Levels
Less than 25%
25% to 50%
50% to 75%
Above 75%
140
130
120
110
100
90
80
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
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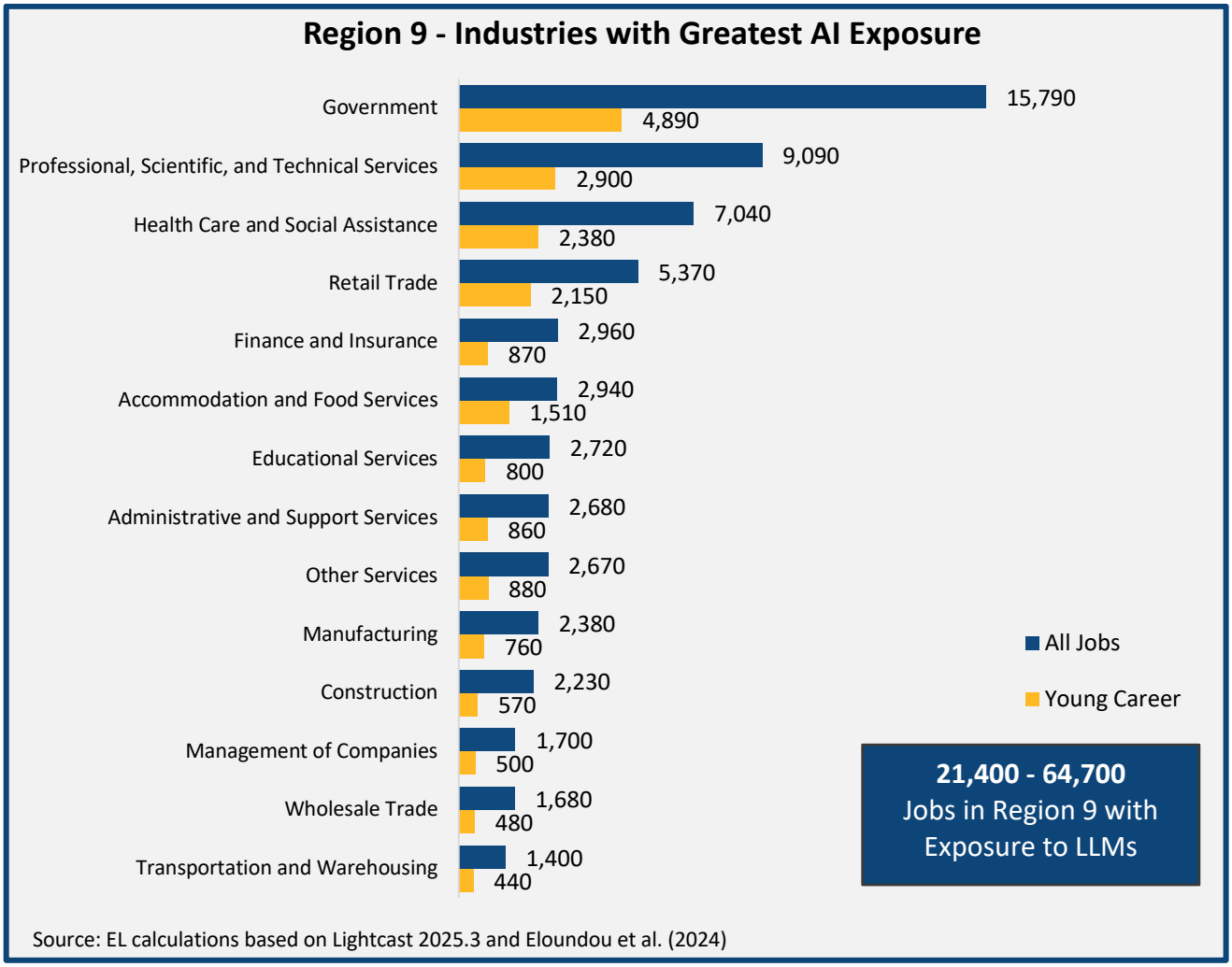

Region 9 - Industries with Greatest AI Exposure
Government
15,790
4,890
Professional, Scientific, and Technical Services
9,090
2,900
Health Care and Social Assistance
7,040
2,380
Retail Trade
5,370
2,150
Finance and Insurance
2,960
870
Accommodation and Food Services
2,940
1,510
Educational Services
2,720
800
Administrative and Support Services
2,680
860
Other Services
2,670
880
Manufacturing
2,380
760
Construction
2,230
570
Management of Companies
1,700
500
Wholesale Trade
1,680
480
Transportation and Warehousing
1,400
440
All Jobs
Young Career
21,400 - 64,700
Jobs in Region 9 with Exposure to LLMs
Source: EL calculations based on Lightcast 2025.3 and Eloundou et al. (2024)

For Region 9, given the projected industry and occupational impacts, many of the K-12 and higher ed-related recommendations in Section 5 should be prioritized within the region. To support the development of the region's target sectors, recommendations from Section 5 that address upskilling incumbent workers to be able to take advantage of emerging opportunities will be critical. The recommendations on resources and ecosystem support for early-stage AI ventures are also likely to be important in Region 9 given the level of AI-related research and innovation related to the University of Virginia. The specific recommendation about establishing a Virginia AI Center of Excellence involving multiple higher education institutions throughout the Commonwealth should be a priority in Region 9 as well. Finally, as in all other regions, the recommendations related to convening regional businesses and workforce training partners to obtain and disseminate real-time workforce skills information should be an important area of focus for regional leaders.

Appendix C - Transferable Skills Analysis

In a rapidly shifting job market, workers will likely need to shift between occupations and different industries. Workers will also be more likely to need more career training and skill development throughout their working life rather just at the beginning of their career. Employers will also need to shift beyond their usual recruitment pools to find enough talent to meet their workforce needs. One option to understand where talent can be upskilled in a community is a transferable skills analysis. This type of analysis pinpoints skills in the current labor force that can be applied across various sectors. This information can help better tailor workforce training and development initiatives to meet emerging industry demands.

A transferable skills analysis can also help an employer in a region find new sources of labor that are well-positioned to retool to the types of jobs the company is looking to fill. Understanding skills transferability can help a region better attract new businesses by understanding the assets and adaptability of the labor force. For this report, four occupations were analyzed by their skills to demonstrate how workers could move from occupations with high AI exposure while still improving their wage outcomes.

Some of the best candidates for measuring transferable skills are occupations that are already declining in some regions. Net employment change was measured for each occupation in the state from 2022 (ChatGPT's launch) to 2024. These losses were also compared to the occupation's AI exposure score. This informed EL's choice of occupations that would be best for a transferable skills analysis. Bookkeeping, accounting, and auditing clerks were chosen because it was one of the top occupations experiencing decline along with a high AI exposure score. Customer service representatives were chosen as the job with the largest decline since 2022 and a moderate exposure score. Web developers and medical transcriptionists were occupations selected for skills transfer analysis due to their higher exposure scores and moderate job decline in recent years.

Occupations with Net Decline in Virginia, 2022 - 2024

Occupation	Job Change	LLM Exposure
Customer Service Representatives	-7,980	57%
Cashiers	-6,240	24%
Office Clerks, General	-5,680	57%
Stockers and Order Fillers	-4,390	18%
Sales Representatives, Wholesale and Manufacturing	-3,220	61%
Bookkeeping, Accounting, and Auditing Clerks	-2,660	78%
Driver/Sales Workers	-2,570	29%
Food Preparation Workers	-2,130	5%
Receptionists and Information Clerks	-2,040	53%
Miscellaneous Assemblers and Fabricators	-2,010	23%
Web Developers	-530	93%
Medical Transcriptionists	-250	87%

For these four occupations, the skills gained on the job were compared to the skills needed in other occupations to determine where there may be compatibility. For every occupation code in the US, the Bureau of Labor Statistics (BLS) has determined the type of skills, both hard and soft, used in the job. The level or usage of each skill in each occupation is scored from 0 to 100. The best options for career development can be determined by the skills that have already been honed. These skills are compared with high-demand jobs in the economy that offer a wage increase, have high compatibility (ranked on scale from 0 to 100), and have AI exposure scores lower than 60 percent.

Skills can offer connections between occupations that may not be expected. For example, a hairdresser may be a great candidate for phlebotomy. This is because the physical skill of being able to cut hair displays a high level of steadiness and dexterity that can transfer directly into a phlebotomist position where the worker must safely draw a patient's blood.

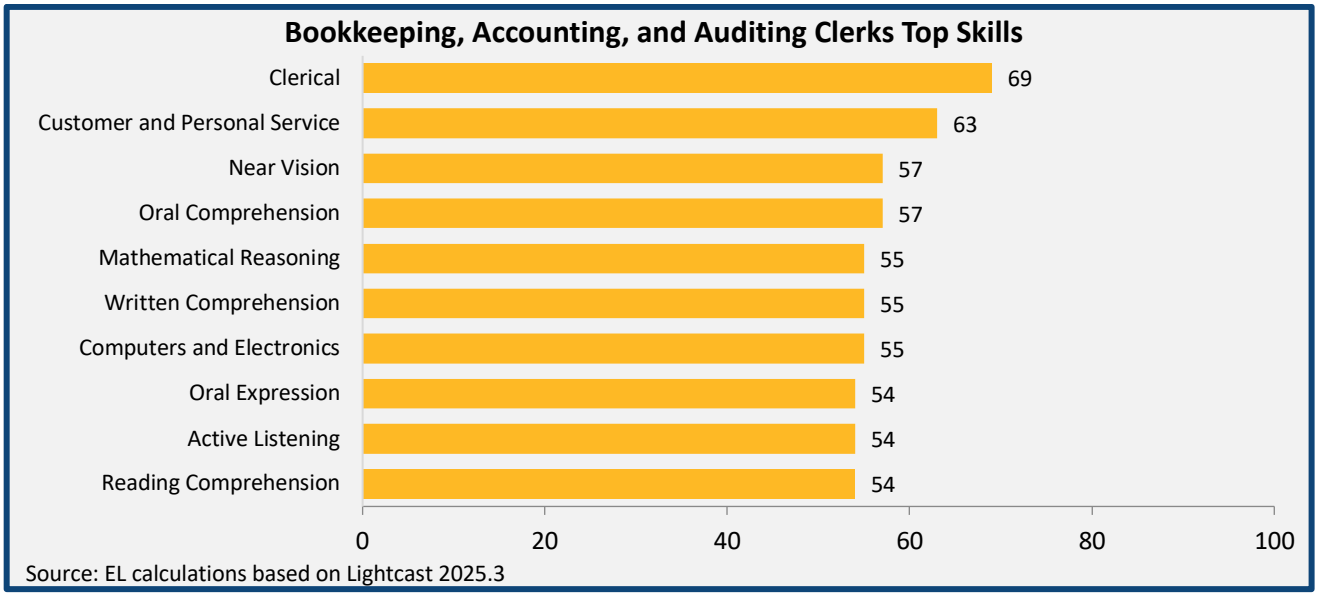
Amidst a rapidly changing landscape in the age of AI workforce development will need to be more expansive. On the sidelines of the labor force there could be more former customer service representatives or medical transcriptionists. Growing companies with high demand may need help understanding how these workers could be great candidates for their positions of need. Skills can be a compelling connector of two seemingly unrelated careers.

This skills analysis highlights many opportunities where workers could transfer from lower paying and high AI exposure jobs into higher paying and lower AI exposed careers. Sometimes the shift might only require minimal training. Postsecondary and K-12 education will play a key role in many of these job transfers. Employers in the region can partner with local workforce development and postsecondary institutions to formalize some of these skills transfers.

Transferrable Skills Analysis – Bookkeeping Accounting, and Auditing Clerks

Using skills mapping techniques, the skillset of bookkeeping, accounting, and auditing clerks were measured. These jobs earn about $23.40 per hour in Virginia. The most typical path to these jobs is completing high school (41 percent) or earning a postsecondary certificate (21 percent). While on the job, these workers build skills in customer service, mathematics, and various software programs among many others.

These skills can transfer to several jobs that offer a wage increase and lower AI exposure. Many of the most compatible occupations are occupations that dive deeper into financial analysis like credit analysts or loan officers. These workers are also great candidates to receive further education to become accountants and auditors. Their clerical and finance background can also transfer into research positions in the legal and insurance fields.



Top Transferable Occupations for Bookkeepers, Accounting, and Auditing Clerks by Compatibility

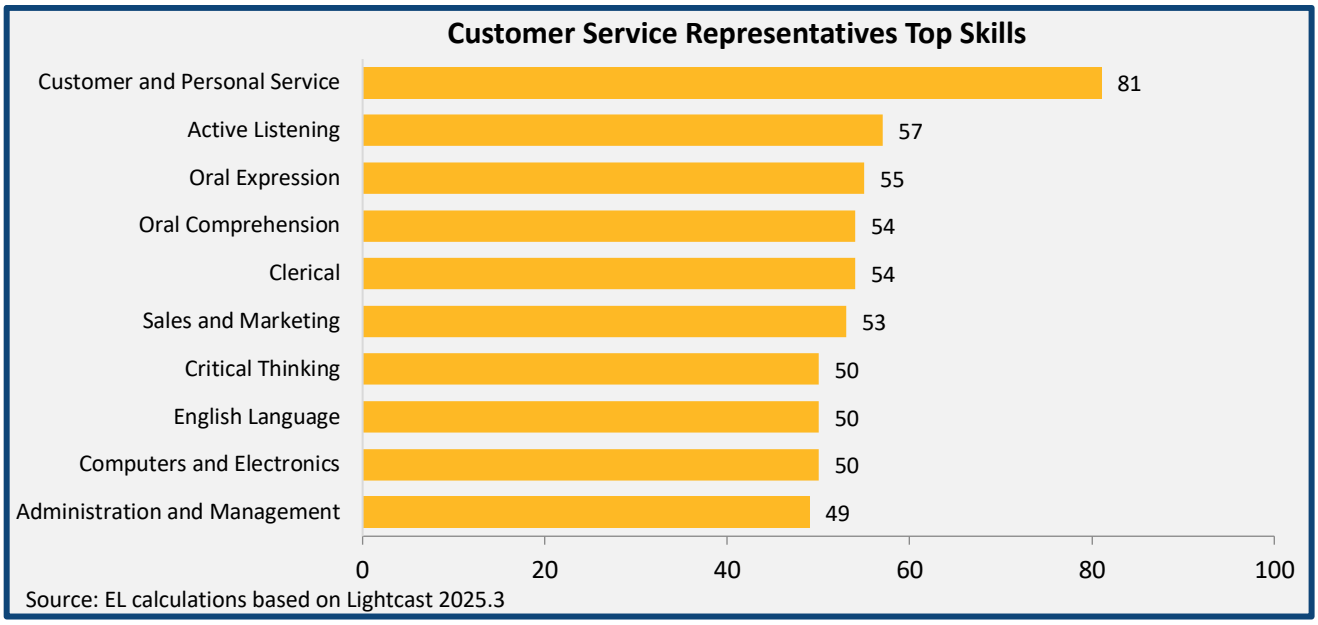
Occupation	Median Hourly Wage Change	Projected Annual Openings	Compatibility Index	LLM Exposure Score
Tax Examiners, Collectors, and Revenue Agents	+$3.70	95	95	56%
Insurance Underwriters	+$13.70	190	95	57%
Credit Analysts	+$23.50	120	93	55%
Paralegals and Legal Assistants	+$6.00	590	93	50%
Loan Officers	+$14.90	450	92	58%
Budget Analysts	+$28.90	140	91	50%
Accountants and Auditors	+$17.10	2,320	90	55%
Claims Adjusters, Examiners, and Investigators	+$13.60	380	88	53%
Compensation and Benefits Specialists	+$14.70	30	88	48%
Personal Financial Advisors	+$24.70	330	88	50%
Weighers, Measurers, and Samplers	+$1.20	180	85	34%
Cargo and Freight Agents	+$0.90	210	83	40%

Transferrable Skills Analysis – Customer Service Representatives

Customer service representatives was the occupation grouping with highest levels of net job decline in recent years in Virginia. The AI exposure score for this occupation is 57 percent. Many people have experienced having to first interact with an AI chatbot when they contact a company about a return or problem.

These jobs in Virginia typical pay around $18.85 an hour. They do not typically require postsecondary education and about 45 percent of the workforce only graduated high school. People with experience in these jobs are familiar with dealing with people and gain several soft skills by communicating with customers and solving their problems. These workers must be proficient in the English language, and they might even know additional languages.

These skills are highly compatible with other customer service jobs that have lower AI exposure like ticket agents or insurance sales. Their front facing skills can also transfer to jobs as pharmacy technicians or in social services. Dental assistants conduct much of the interacting with patients during a visit and could be a compatible fit. A switch to event planning could leverage their listening, administrative, and problem-solving skills. Such a shift could result in an increase in over $10 in hourly wage. At 48 percent exposure, event planners are less likely to be impacted by AI technology.



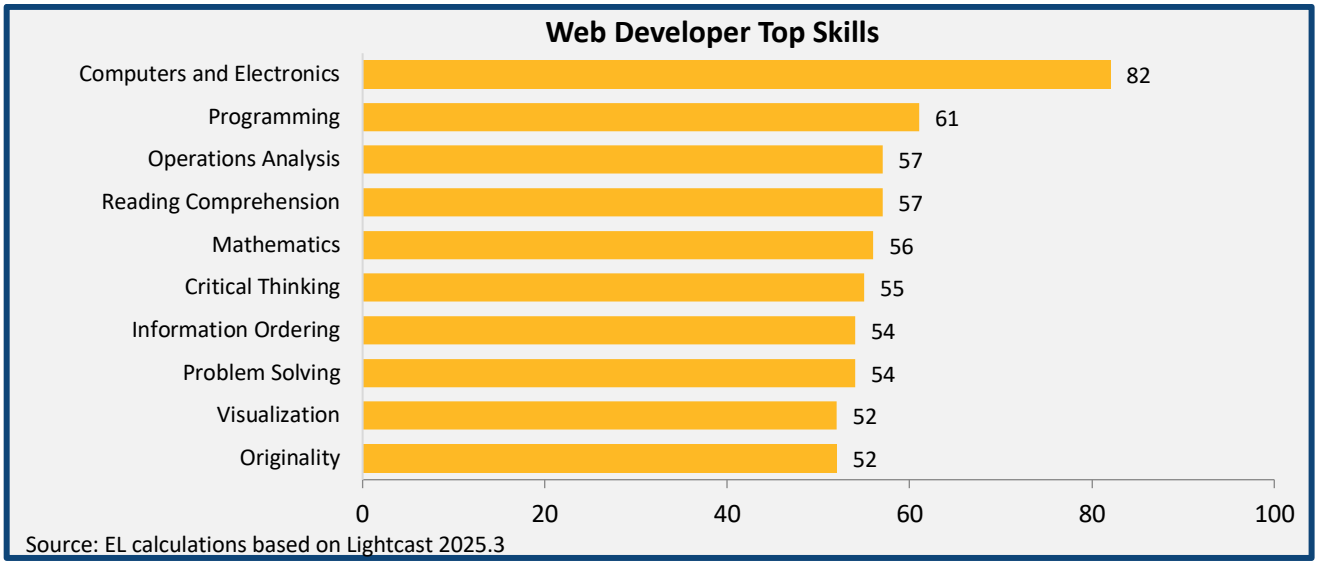
Top Transferable Occupations for Customer Service Representatives

Occupation	Median Hourly Wage Change	Projected Annual Openings	Compatibility Index	LLM Exposure Score
Insurance Sales Agents	+$9.80	970	95	58%
Loan Interviewers and Clerks	+$5.60	375	94	58%
Title Examiners, Abstractors, and	+$5.30	120	94	56%
Transportation Ticket Agents	+$3.50	320	92	45%
English as a Second Language	+$11.15	130	90	41%
Sales Representatives, Technical	+$35.10	370	90	53%
Pharmacy Technicians	+$1.60	810	88	40%
Fundraisers	+$13.40	230	88	50%
Medical Assistants	+$1.50	1,615	87	38%
Social and Human Service	+$1.90	920	86	35%
Event Planners	+$10.20	330	83	48%
Dental Assistants	+$3.70	1,210	83	25%

Transferrable Skills Analysis – Web Developers

Virginia lost a net of 530 web developers from 2022 to 2024. The occupation also has one of the highest AI exposure scores at 93 percent. Many website domain companies can quickly create a basic website for subscribers. This was traditionally one of the careers where more schooling led to a high paying tech career. Most web developers in Virginia earned a bachelor's degree (46 percent). The median hourly wage in the state for web developers was $53.30 in 2024. In the new world of AI, many of these workers may need to upskill to different positions.

Web development provides workers with many hard skills like operating programming software and understanding different coding languages. However, there are broader skills learned that include visual design, creativity, and analysis. Web developers may generate experience with statistics from tracking trends in engagement on websites they create.



Source: EL calculations based on Lightcast 2025.3

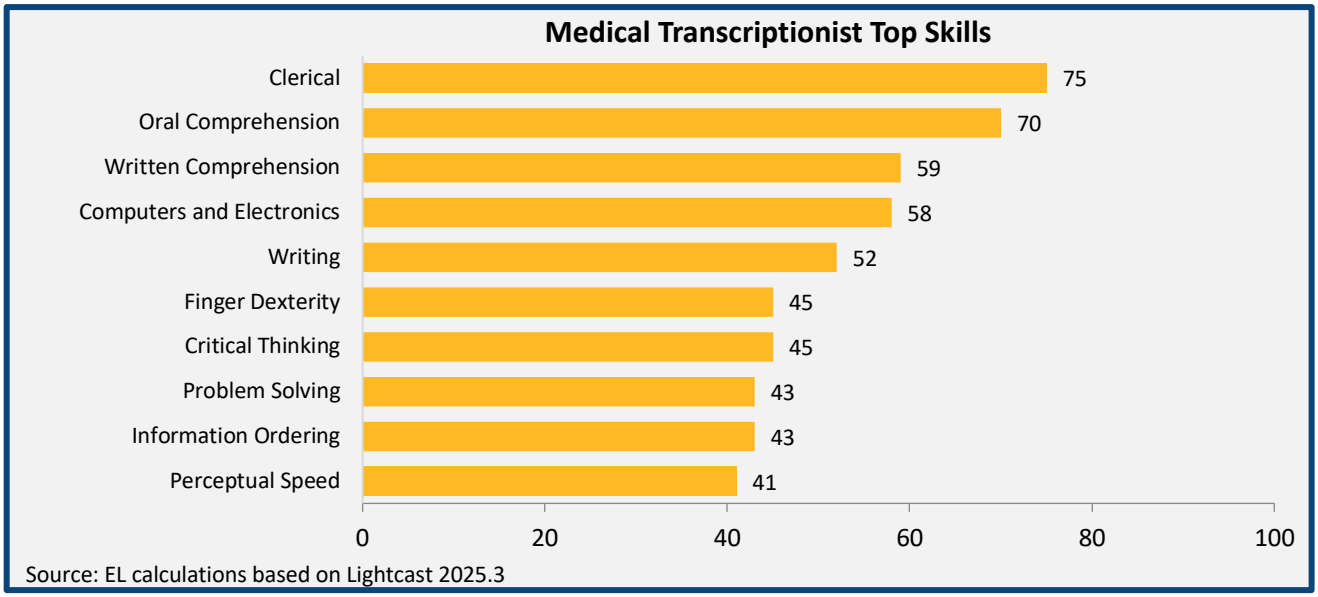
Web developers are great candidates to upskill within the tech space by becoming managers of IT teams. Other compatible options include careers like actuaries, economists, geographers, hydrologists, and air traffic controllers. While these careers have different domain expertise that would need to be gained, they all utilize sophisticated computer software programs to execute their functions. Jobs like air traffic controllers are so critical for safety that they are more protected from AI automation. Another approach could be utilizing visualization, information ordering, and design skills to help develop branding strategy for a political campaign. Such a shift could result in a $25.50 hourly increase in earnings.

Top Transferable Occupations for Web Developers

Occupation	Median Hourly Wage Change	Projected Annual Openings	Compatibility Index	LLM Exposure Score
Information Systems Managers	+$39.45	800	90	53%
Actuaries	+$12.05	50	82	50%
Marketing Managers	+$31.90	400	81	50%
Economists	+$17.90	50	81	50%
Purchasing Managers	+$24.30	160	79	58%
Atmospheric and Space Scientists	+$0.50	40	76	54%
Geographers	+$10.15	15	75	50%
Air Traffic Controllers	+$36.10	170	73	35%
Hydrologists	+$6.80	20	72	50%
Political Scientists	+$25.50	70	72	50%
Industrial Production Managers	+$5.90	190	70	48%
Materials Scientists	+$3.85	20	69	47%

Transferrable Skills Analysis – Medical Transcriptionists

Another career with high exposure to AI automation are medical transcriptionists. In the coming years, more workers with experience in this field could be looking for different opportunities as a physician can talk into a microphone and have all their notes written immediately into formal reports. The job currently pays about $17.85 an hour. Most workers enter the field with a postsecondary certificate. The job often requires the worker to listen to physician voice recordings and transcribe these into compliant reports. These workers develop a range of skills like quick oral interpretation and finger dexterity (from hours of typing). They also develop computer skills from utilizing the health care systems software programs for creating patient reports.



Source: EL calculations based on Lightcast 2025.3

These skills correlate with many other careers. Many of the most compatible options for upskilling include leveraging their overall medical knowledge into a healthcare technician occupation like phlebotomy. With an extra credential that can be garnered at a community college in less than a year, the worker could be earning more than $4 an hour with a job at much lower risk of AI automation. A medical transcriptionists ability to quickly process information could also translate into jobs outside of healthcare like a transportation security screener or a quality control position within the manufacturing sector (weighers, measurers, and samplers).

Top Transferable Occupations for Medical Transcriptionists

Occupation	Median Hourly Wage Change	Projected Annual Openings	Compatibility Index	LLM Exposure Score
Library Technicians	+$3.85	230	89	57%
Ophthalmic Medical Technicians	+$2.15	265	85	33%
Insurance Underwriters	+$19.20	190	85	57%
Pharmacy Technicians	+$2.60	810	83	40%
Weighers, Measurers, and Samplers	+$6.70	180	81	34%
Dental Assistants	+$4.70	1,210	79	25%
Phlebotomists	+$4.10	470	78	17%
Nursing Assistants	+$0.80	6,530	77	11%
Food Science Technicians	+$10.10	35	75	34%
Social and Human Service Assistants	+$2.90	920	74	35%
Psychiatric Technicians	+$4.30	500	71	13%
Transportation Security Screeners	+$13.30	230	71	27%

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