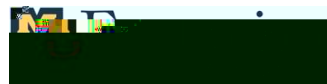Dr. Mark C. White
University of Missouri Extension

Sinquefield Center for Applied Economic Research
Saint Louis University

SLU RESEARCH

The National Geospatial-Intelligence Agency (NGA) anchors St. Louis' emerging geospatial technologies and applications cluster. It employs roughly 3,700 workers (3,150 in St. Louis and 550 in Arnold) in many skilled, high-paying jobs. Attracting and developing a workforce with the specialized skills required to staff this agency will be critical to NGA's current and future success. It is also necessary to establish St. Louis as a leading center for geospatial technology. This white paper uses information drawn from NGA's online job advertisements to provide insights about the agency's workforce needs. It also examines the extent to which other employers, both in St. Louis and in other US metro areas, have similar workforce needs.

Between September 1, 2018 and August 31, 2020 there were 263 job postings at NGA's St. Louis facilities—220 in St. Louis and 43 in Arnold. During this period, the majority of NGA job advertisements displayed a preference for applicants with three common characteristics. These characteristics include a

The National Geospatial-Intelligence Agency (NGA) anchors St. Louis' emerging geospatial technologies and applications cluster.[1] NGA is both an intelligence and combat support agency that provides policymakers, warfighters and intelligence professionals with timely, accurate and actionable geospatial-intelligence.[2] Headquartered in Springfield, VA, NGA has a significant presence in the St. Louis, MO-IL Metropolitan Statistical Area (MSA). It employs roughly 3,700 workers (3,150 in St. Louis and 550 in Arnold) in many relatively high-paying jobs, making it one of the St. Louis metro area's leading employers. Moreover, NGA is expanding its St. Louis footprint with the construction of the $1.7 billion NGA West facility north of downtown St. Louis.[3] Attracting and developing a workforce with the specialized skills required to staff this agency will be critical to NGA's success, but it is also necessary for establishing St. Louis as a center for geospatial technology.

Given the nature of NGA's mission and activities, many of their operational needs are not made public. However, examining NGA job advertisements can provide some insights about the agency's workforce needs. The analysis presented here uses Burning Glass Technologies' *Labor Insight* tool to identify the types of workers NGA seeks to hire.[4] This tool extracts information from online job advertisements to determine the skills, certifications and experience valued by specific industries and

We examined job advertisements for positions specific to NGA's St. Louis and Arnold facilities in the two-year period between September 1, 2018 and August 31, 2020. Once again recognizing that job advertisements are the not the same as jobs, but during that two year period there were 263 job postings at NGA's St. Louis facilities—220 in St. Louis and 43 in Arnold. The pace of NGA's hiring has increased, as 200 of these job advertisements (76 percent) were posted between September 1, 2019 and August 31, 2020.

During this period the majority of NGA job advertisements displayed a preference for applicants with three common characteristics, including:

241 of the 263 NGA job postings required applicants to have at least a bachelor's degree (5 postings noted greater education, 5 less, and 17 postings were unspecified). As a result, NGA primarily advertises for positions that require skilled and trained professionals.

140 of the 263 NGA job postings provided experience requirements; all but 5 of those job postings sought applicants with at least 3 years of experience (**Figure 1**). Among the postings that listed experience requirements, 65.7 percent wanted applicants with at least 3 to 5 years of experience and 28.6 percent with 6 to 8 years of experience. This is not to

: Almost every job posting (239/263; 20 unspecified) indicated that the successful candidate must obtain and retain a security clearance as a condition of their employment. This requirement can somewhat limit the applicant pool as people with a criminal record or excessive debt may not be able to meet this requirement. Nevertheless, this requirement also likely draws applicants who currently possess a security clearance or have held one in the past. These applicants may include, for instance, veterans or exiting military, or workers currently employed by other federal agencies or contractors.

These common trends indicate the NGA values highly educated workers with some experience in their field. Moreover, the security clearance requirement indicates that NGA views experience in government broadly, or in defense or intelligence-related activities more specificallequd

These broad occupational groups provide a rough sense of the demand exhibited by the job postings. However, Burning Glass Technologies provides a more detailed and granular set of occupations.[5] Whereas NGA hires for a wide variety of positions, the job postings data show us the positions that NGA most frequently advertised for during the study period. These occupations include:

gather, produce and analyze data that can be used in maps or products derived from geographic information systems (GIS).

| | 19 | 3-5 years: 7
6-8 years: 6
Unspecified: 6 | Photogrammetrist (5)
Imagery analyst (3)
US military imagery
analyst (3)
Cartographer (2) | |

NGA is one of many St. Louis area employers seeking IT-related workers. During the study period, there were over 32,000 job postings within the St. Louis, MO-IL MSA for each of the five key occupations mentioned earlier; NGA had a combined 81 job postings for these five occupations. Figure 4 shows that much of this demand was for occupations such as software developers or engineers, and more limited demand for more specialized occupations such as GIS specialists, data scientists and UI/UX Designers. Figure 4 also shows that workers needed to fill positions in secure environments represents an even more specialized segment of the labor force.

Within these five key occupations, almost 2,300 job postings (7 percent) indicated the need for a security clearance. Overall there were over 11,300 job postings from other firms within the St. Louis, MO-IL MSA (excluding NGA) that identified the need for workers to have, or secure and maintain, a security clearance. This includes companies like Boeing, Leidos, General Dynamics, Booz Allen Hamilton, or federal agencies like the Department of Veterans Affairs. The majority of these job postings were for jobs in either in St. Louis, MO or at Scott Air Force Base in Illinois. Almost 6,175 of these job postings (54 percent) were in computer-related occupations.

These employers all draw from a very similar labor pool as NGA

Dynamics (27), and H2M Group (26). As with NGA many of these job postings sought to attract candidates with 4-year degrees and experience, but almost 20 percent indicated that workers with less than a 4-year degree and less than two years of experience could apply. Almost 19 percent of the job postings noted the need for a security clearance to maintain employment; most of those job postings came from Booz Allen Hamilton and the majority indicated a preference for applicants with at least three years of experience.

During the study period, St. Louis area employers posted almost 1,600 job advertisements for **user experience designers and developers**. Very few of these required a security clearance as a condition of employment. Rather, these job postings come from a wide variety of employers such as professional, scientific and technical services firms like IBM, or finance and insurance companies like Edward Jones or Anthem Blue Cross. Therefore NGA is likely to find candidates with technical experience, but is less likely to find UX designers and developers with experience working in secure environments.

Software developers and engineers are

data shows that employers in both Washington, DC and Baltimore posted significant numbers of job advertisements (requiring a security clearance) for all five of the key occupations mentioned above. This region may represent a source of potential workers, not only for NGA but also for St. Louis' broader government contracting community. The Washington, DC metro area has experienced net domestic outmigration since 2013[8], as many residents leave the region for opportunities in regions with lower cost of living.[9]

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Outside of the National Capital Region, **Huntsville, AL** is the only other metro that met the criteria described above for all five key occupations. Known as 'Rocket City', Huntsville is home to NASA's Marshall Space Flight Center and US Army's Aviation and Missile Comm's M   M   Myenm

distinguishes NGA from the broader set of St. Louis employers seeking tech talent. It also somewhat limits the talent pool from which it might potentially draw.

The job postings indicate that NGA seeks to fill some relatively specialized positions (e.g., GIS Analysts, UX designers) as well as some more common needs (e.g., managers), and these needs often overlap with the

This report used 'Real-Time' Labor Market Information (LMI). Real-Time LMI utilizes web technologies to capture and analyze data derived from job postings and resumes available on public websites.[12] Several proprietary vendors produce Real-Time LMI and this study uses data produced by Burning Glass Technologies, one of the more established vendors in this space. The large volumes of data produced by Real-Time LMI vendors can improve our understanding of labor market dynamics. Once aggregated and organized, these data can show which industries are hiring, where jobs are available, and the education, skills, and certifications that employers seek.[13]

These data draw upon information extracted from a variety of public websites including job boards (e.g., Monster, Career Builder), government agencies (e.g. USAjobs.gov), newspaper ads, and corporate websites (large, medium and small). Burning Glass Technologies (the vendor used in this study) pulls job advertisements from 45,000 different sources.[14] Once collected these vendors use text analytics technologies to parse, extract and code data elements such as industries, locations, occupations, job titles, and required education and certifications among others. This information is gathered daily (hence "real-time"), and therefore provides one advantage over more traditional sources of labor market information where there may be lags of months or years between the time the data are collected and when they are subsequently published.

As with any other data sources, these data come with some caveats. First, it is important to understand what these data say and what they do not say.

imperfect. In this study Burning Glass Technologies' *LaborInsight*