



Workforce Supply Chains

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U.S. policy is spurring a range of ambitious public and private investments that seek to improve national industrial capacity, economic security, and competitiveness, including in R&D and production of critical technologies. These investments serve national goals, but they also create *regional* skill demand shocks to both construct and staff new capacity (e.g. semiconductor fabs), sometimes for industries without historic regional presence. In novel industrial or technological cases, successful workforce development will require local workers to make occupational transitions. Skill supply-demand gaps impeding such transitions can constrain the success of large investments. Parallel workforce demands can draw on and exhaust common pools of talent, with opportunities for closing gaps shaped in part by local training resources and in part by the technology and process design choices of firms. Closing these gaps can also offer improved economic outcomes for workers who gain skills or transition to new roles.

Firms, trainers, government, labor groups and other key decision-makers lack consistent, datadriven methods for evaluating workforce feasibility. Rather than a one-time study for a specific project or technology, a flexible and repeatable capability is needed for decision-support across a range of industrial scenarios, to identify for any given investment proposal the conditions under which that proposal may be feasible from a workforce standpoint, and to support the development of a data-driven strategy for meeting workforce needs.

The Workforce Supply Chains methodology is a capability developed at the Block Center for Technology and Society at Carnegie Mellon to quantify the supply of different types of skills in the U.S. labor market and the potential readiness of workers in one occupation to transition into another. It is currently embedded in both a virtual web-based tool and a local analytics suite. For any of over 1000 occupations (or for a custom set of skill requirements), across any industry, the tool seeks to identify which other occupations are most likely to be well prepared to be the "target occupation" to transition to in terms of skills. With this set of candidate occupations that meet a minimum level of readiness designated by the user, the tool provides estimates of the number of workers available in any region of the country to meet a given level of demand, their demographics and their current wages

The tool estimates not only the stock of talent but the size of the annual pipeline of workers that could be recruited into a new role. This methodology identifies gaps between skill demand and supply both at a moment in time and over a given period, and then quantifies which skills are most frequently missing in the regional labor shed.¹ The tool offers a decision support framework to inform site-selection and expansion strategy based on labor market readiness, as well as highlighting instances where recruitment and training alone cannot close supply-demand gaps.

¹ A labor shed consists of a user-defined selection area (in our tool, this can be at the metropolitan statistical area, state or national level), and occupational employment is based on the workers that currently work in this area. Planned improvements with longitudinal data include estimating the number of workers previously but not currently working in different occupations.