

JOINT TRANSPORTATION RESEARCH PROGRAM

Principal Investigators: Indraneel Kumar, Purdue University, ikumar@purdue.edu, 765.494.9485

Lionel Beaulieu, Purdue University, ljb@purdue.edu, 765.494.9485

Program Office: jtrp@purdue.edu, 765.494.6508, www.purdue.edu/jtrp

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SNIP Light User Manual an Assessment of the Workforce and Occupations in the Highway, Street, and Bridge Construction Industries in Indiana

Introduction

This report includes findings and takeaways from the three data analysis reports and workforce development policy report prepared for the Indiana Department of Transportation (INDOT) by a team from the Purdue Center for Regional Development. The deliverables for SPR-4446 include workforce analysis for NAICS 237310 (highway, street, and bridge construction industry) from the perspective of industry, occupations, job postings, hard-to-fill jobs, classification of instructional programs (CIP), compatibility, GAP analysis, and automation. Two additional data reports examined jobs-to-jobs flows to-and-from the construction industry, as well as equal employment opportunity data obtained from the FHWA and INDOT. All data analyses were conducted for covered jobs or QCEW (Quarterly Census of Employment and Wages) using unsuppressed jobs data from economic and labor market databases. The state of Indiana and INDOT districts serve as the geographic focus of this study. The workforce development policy report is based on research literature, secondary data analysis, and discussions held with key informants from Departments of Transportation in Colorado and Florida who have workforce development expertise. Finally, an online data dashboard showcasing select data for individual INDOT districts is produced. The dashboard includes statistics for each INDOT District on occupations and staffing patterns within the NAICS 237310.

Findings

- The highway, street, and bridge construction (NAICS 237310) industries in Indiana have value chain linkages with mining (e.g., sand and gravel) and durable manufacturing (e.g., asphalt, concrete, prefab and structural metals). Furthermore, the sector has economic connections with long distance freight,

construction equipment rental and maintenance, and professional engineering services.

- The NAICS 237310 industries fared better during the Great Recession (2008–2009) despite declines witnessed in other construction industries. The post-recession recovery was faster and, in general, maintained a year-by-year LQ (location quotient) of 1.0 or higher—a reflection of the competitive nature of the industry.
- The staffing patterns for NAICS 237310 reveal that its major occupational grouping is construction and extraction jobs followed by transportation and material moving, which together constitute 80% of all jobs in this sector. At the most detailed level, construction laborers have the largest number of jobs, followed by operating engineers and other construction equipment operators, heavy and tractor-trailer truck drivers, and first-line supervisors of construction trade and extraction workers. Each of the six INDOT districts has the same top two occupations—construction laborers and operating engineers and construction equipment operators—although subtle differences in the occupational makeup and staffing patterns exist within the NAICS 237310 industry.
- Hard-to-fill occupations are in high demand but difficult-to-fill in the labor market. These include surveyors; civil engineers; health and safety engineers (except mining); truck drivers; freight stock and material movers; various first line supervisors; and a variety of mechanics, maintenance, and repair workers. Each of the six INDOT districts shows an anticipated GAP or an under-supply of truck drivers, mechanics, equipment operators, masons, carpenters, etc., in the next five years.
- CIP analysis documents the existence of large gaps between program completion and openings in such occupations as surveyors, mobile heavy-equipment mechanics, heavy and tractor-trailer truck

drivers, etc. However, compatibility analyses are undertaken for occupations with the most severe supply/demand gaps, such as surveyors; industrial safety and health engineers; maintenance and repair workers; and heavy equipment mechanics. At the same time, an automation analysis reveals that some occupations with higher gaps are at risk of being automated in the future. Both compatibility and automation analyses are informative in guiding the development of talent pipeline and workforce supply chain strategies.

- Jobs-to-jobs flow analysis reveals that moderate flows of construction workers to and from Indiana to specific states, such as Illinois, Ohio, Michigan, Kentucky and Texas, occurred during the Great Recession (2008–2009). Administrative, support, waste management, and remediation services sectors experienced the largest exchange of workers with the construction sector.
- Analysis of Equal Employment Opportunity reveals that occupational categories of Section 1391 and 1392 data may be outdated since they fail to align with existing Bureau of Labor Statistics (BLS) Standard Occupation Classification (SOC) categories. In addition, the compilation of race and ethnicity information departs from the U.S. Census Bureau's classification. This makes analysis of racial and ethnic diversity in the highway, street, and bridge construction industry workforce challenging.

Implementation

It is recommended that INDOT invest resources on an annual basis to maintain the interactive online website and incorporate critical new data on occupations and staffing patterns for every district. The data analysis activities and workforce policy assessments being pursued by some other state DOTs make it clear that INDOT districts should avoid pursuing a one-size-fits-all workforce development strategy. Rather, a workforce development plan that is tailored to the unique workforce needs of each district should be embraced. Simply put, the blend of occupations, staffing patterns, and magnitude of gaps in supply and demand should be carefully examined on a district-by-district basis.

It may be worthwhile to invest in a workforce development pilot effort in one district based on the recommended steps and partners suggested in our workforce policy report. This would include the active involvement of key stakeholders, community representatives, and institutional partners/collaborations who could serve in an advisory role for the district. Equally important would be the pursuit of more robust evaluation strategies since existing data collection methods—such as Section 1391 and 1392—are not sufficient to achieve diversity and gender equity goals.

Other implementation recommendations being proposed include the following:

- Integrate and implement a general career pathway for vital construction sector, including employment training and ways to deploy it.
- Provide opportunities that encourage and foster a regional approach within each INDOT district—one tailored to the unique workforce recruitment and development needs of each district.
- Develop a network of support services that can be tapped across INDOT districts. These resources could be crucial to the retention of INDOT's newly trained workforce.
- Coordinate efforts to diversify Indiana's construction workforce. This would involve outreach to trade groups with active outreach to minorities, women, people with disabilities, and veterans.

Recommended Citation for Report

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