

L&D On-ramps and Off-ramps for the Mobility Workforce: A Blueprint for Knowledge Ecosystem Formation in the Fourth Industrial Revolution

Tyler Reeb, PhD

Barbara Taylor, PhD

James Reuter

Project 2333

November 2024



Introduction

This report introduces and discusses the proof-of-concept pilot program proposed in a previous report, Trade and Transportation Talent Pipeline Blueprints: Building University-Industry Talent Pipelines in Colleges of Continuing and Professional Education. This study validates the feasibility of university industry partnerships in establishing a dynamic “third space” conducive to the development of workforce-informed, multi-tiered curricula essential for professional growth and workforce development. The research focuses on the transportation and mobility sector, conducting talent pipeline pilots in intelligent transportation systems and data science. These areas of focus, representing both a field of study and a research methodology, align closely with the technological advancements characteristic of the Fourth Industrial Revolution (4IR).

Study Methods

The authors engaged stakeholders through surveys and focus groups to explore the university’s role in workforce development and career training. The majority of respondents (90%) were faculty, staff, and

administrators from all colleges and the library at California State University, Long Beach (CSULB) (only 10% of respondents were from outside the university). Additionally, the authors documented and assessed the implementation of two pilot talent pipelines. First, an Intelligent Transportation Systems (ITS) Engineering Talent Pipeline was implemented at CSULB, as recommended by Reeb and Park (2023). This involved developing a specialized curriculum in the spring semester, followed by three internship opportunities at Gannett-Fleming, a prominent global engineering firm. A second pilot talent pipeline was developed in coordination with the NASA Jet Propulsion Laboratory (JPL), a renowned leader in space exploration and satellite technology. This pilot took place during the spring and summer of 2023 and included a two-day data science workshop led by JPL employees, followed by the possibility of up to 10 summer internships at JPL. By conducting these pilots, one course-based and one workshop based, alongside related survey and focus group research, this project’s methods provide an assessment of the levels of support for university-industry partnerships at CSULB.

Findings

The stakeholder survey recorded near universal support for pursuing university-industry partnerships with 97% of CSULB faculty and staff and external stakeholders supporting the concept. The responses to open-ended questions in the stakeholder survey reflected the following concerns and priorities: the need for inclusive interdisciplinary collaboration across the university; effective and transparent communication within the university and with industry partners; aligning university efforts with the current and future requirements of industry; the need for incentives, both for students to engage in experiential learning opportunities and for departments to collaborate and share resources; and recognition of and support for the efforts of faculty and departments involved in these initiatives.

Regarding the pilot projects themselves, the students who pursued the JPL internship expressed enthusiasm for the workshops, noting that (among other things) the format was more intimate and less intimidating compared to other career and professionalization opportunities. Importantly, students cited benefits that manifested whether or not they ultimately received an internship. Gannett Fleming plans to adopt the workshop format used by JPL in future talent pipeline efforts. Regarding both pilots, the talent pipeline format's bidirectionality and close coordination allow both industry and university partners to quickly implement improvements to future iterations of the pipeline. Both industry partners expressed a desire to continue participating in partnerships with CSULB.

Policy Recommendations

This report further substantiates the policy recommendations from the previous paper, *Trade and Transportation Talent Pipeline Blueprints: Building University-Industry Talent Pipelines in Colleges of Continuing and Professional Education* and demonstrates that university-industry partnerships can cultivate knowledge ecosystems where collaboration, innovation, and learning collectively address the critical challenges faced by the California trade and transportation sector, as well as other workforces undergoing rapid transformations driven by the 4IR. The efforts documented in the report can and should be scaled across campuses and industry sectors. The authors recommend that CSUs engage their respective

colleges of professional and continuing education. These units are able to respond to a rapidly changing socioeconomic landscape much more nimbly than the university as a whole and are able to do so without a disruption to the higher calling of educational institutions or an onerous increase in faculty or staff workloads.

About the Authors

Dr. Tyler Reeb, serves as Executive Director at the Center for International Trade and Transportation at California State University, Long Beach. He oversees a multimillion-dollar portfolio of sponsored research that addresses rural, tribal, Intelligent Transportation Systems (ITS), supply-chain and logistics, zero-emission technologies, automation, data privacy, community engagement, and a range of workforce development issues.

Dr. Barbara Taylor serves as the Interim AVP of the Office of Research and Sponsored Programs at California State University, Long Beach. Taylor is currently the Associate Dean for Research in the College of Natural Sciences and Mathematics.

James Reuter is a project manager at the Center for International Trade and Transportation at California State University, Long Beach. James received his Master's in Philosophy from CSULB and Bachelor's in Philosophy and History from Kalamazoo College.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/2333



MTI is a University Transportation Center sponsored by the U.S. Department of Transportation's Office of the Assistant Secretary for Research and Technology and by Caltrans. The Institute is located within San José State University's Lucas Graduate School of Business.