

Increasing Pathways into Transportation Careers

Engineering Pathway Study Team
for
PacTrans Workforce Development Workshop

May 19, 2025

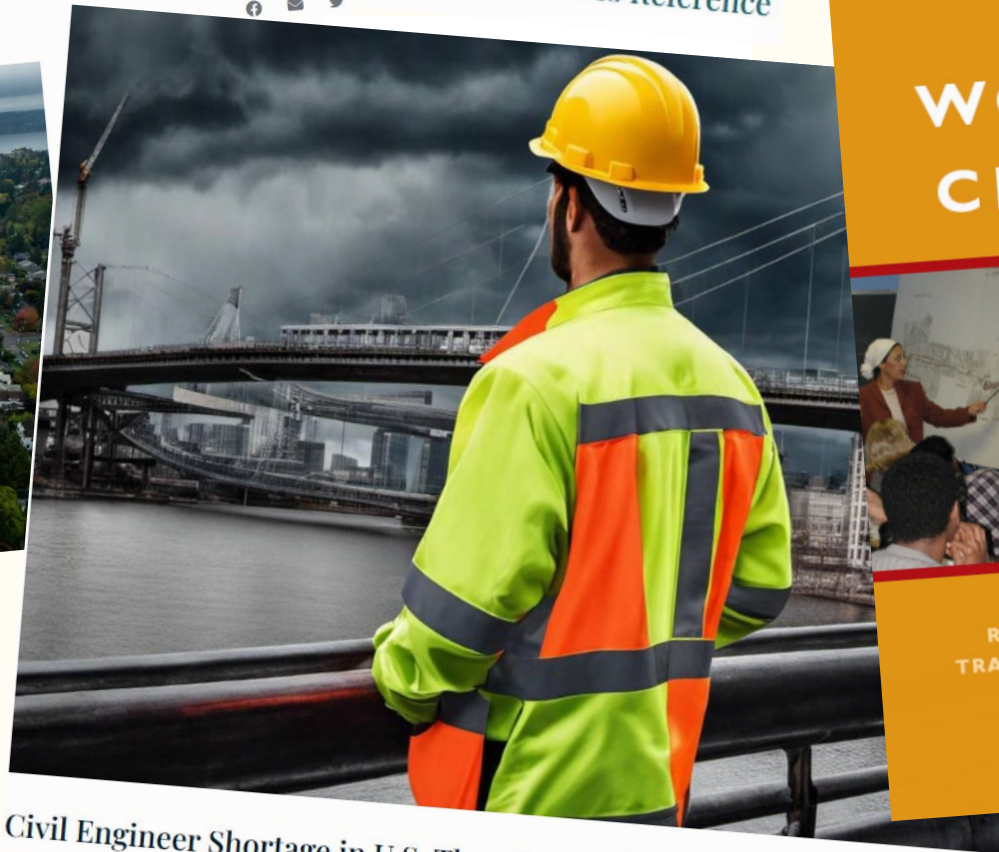


Project Background and Importance

The Seattle Times

Lack of civil engineers a bottleneck for WA's large transportation projects

Oct. 24, 2023 at 6:00 am



Civil Engineer Shortage in U.S. Threatens Infrastructure Projects



Electronics Reference

SPECIAL REPORT 275

THE WORKFORCE CHALLENGE



RECRUITING, TRAINING, AND
RETAINING QUALIFIED WORKERS FOR
TRANSPORTATION AND TRANSIT AGENCIES

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Project Background and Importance



Purpose & Initiation

Addresses workforce challenges in civil engineering & surveying across Washington State.

Initiated in response to widespread concerns raised by multiple resources.



Study Approach

Online surveys and phone/zoom interviews

Analyzing the responses with text mining, statistical techniques, and topic modeling

Aim: Gather real-world insights, not just academic perspectives.



Survey Participation

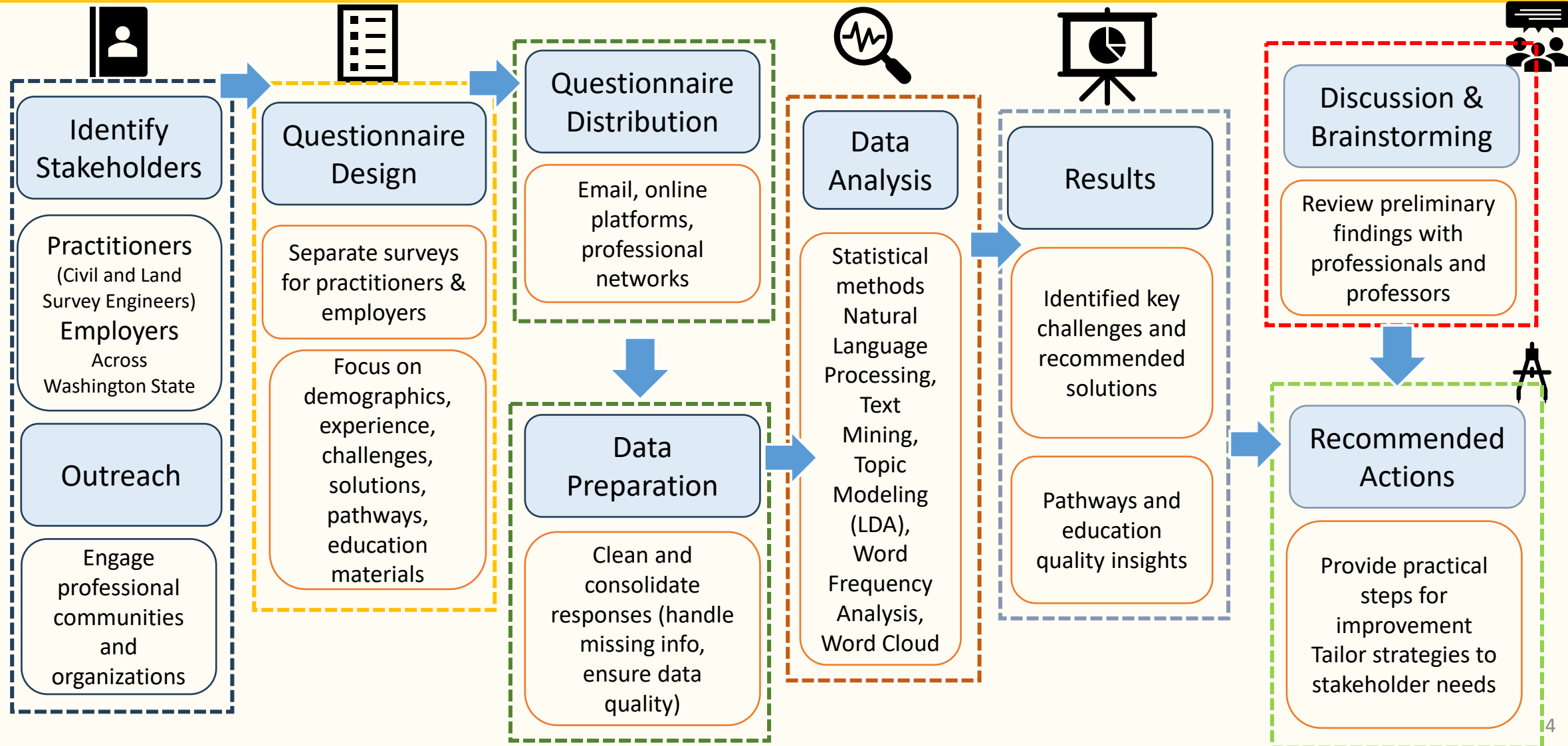
Two comprehensive surveys: one for employers and one for practitioners.

Employers: 47 responses

Practitioners: 917 responses

Education Institutions: 10+

Study Workflow



Project Data

- **Motivation:** Understanding demand from transportation agencies and industry

- **Designed and Conducted** Two Comprehensive Online Surveys:
 - **Practitioners:** 917 responses
 - 68.2% with over 20 years' experience
 - **Employers:** 47 responses
 - 66% government, 34% private
 - 37% large organizations
- **Interviewed Representatives of Agencies, Companies, and Institutions**

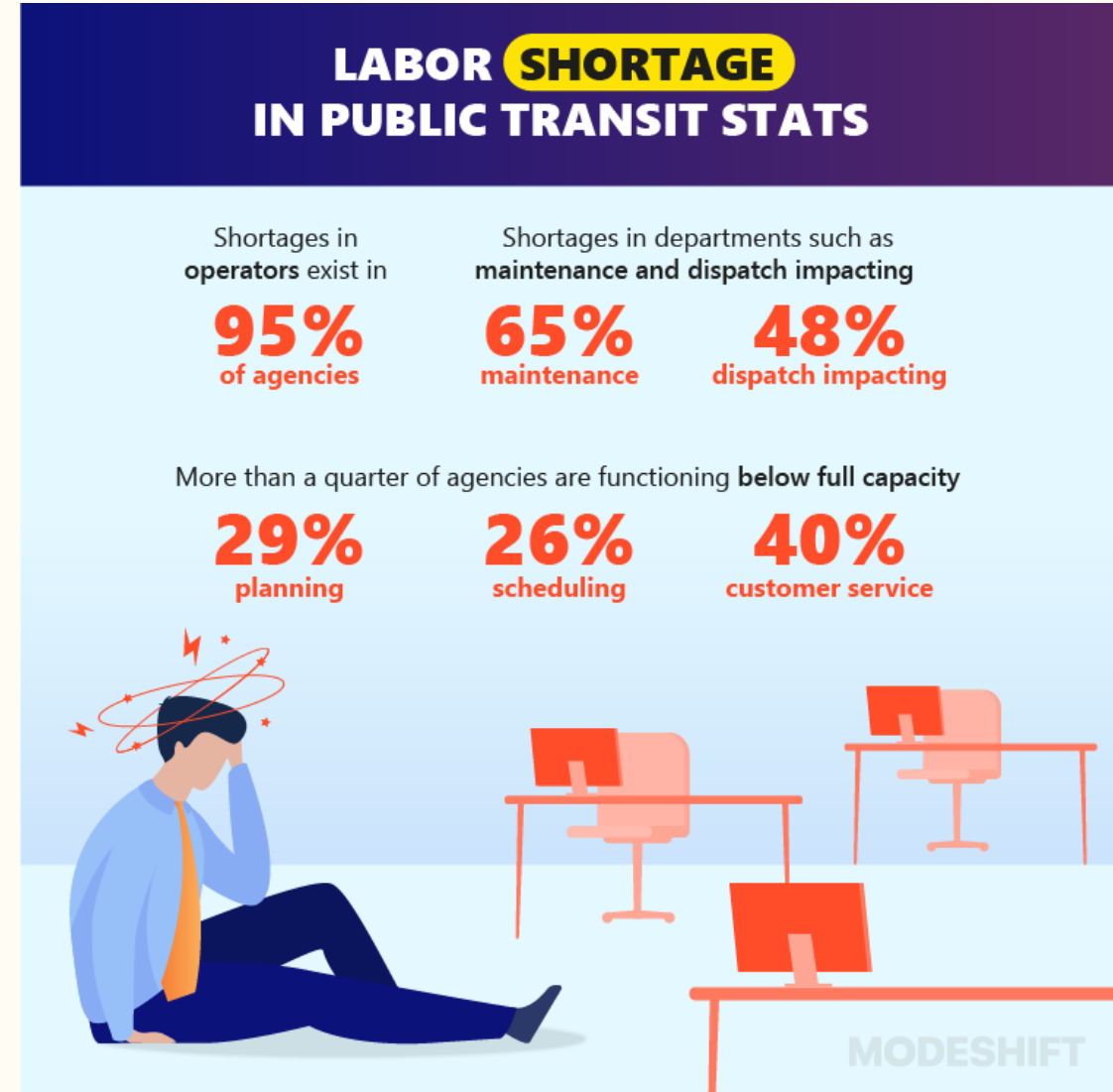
- **Mining Data to** gather real-world insights, beyond academic perspectives
 - Analyzing the responses with text mining, statistical techniques, and topic modeling
 - Findings reviewed with experts and professors

Staffing Challenges

Retirement Crisis Ahead!

- **22%** of employees will be eligible for retirement in the next **5 years**.
- **32%** of employees will be eligible for retirement in the next **10 years**.

Where Are the Talents to Hire?

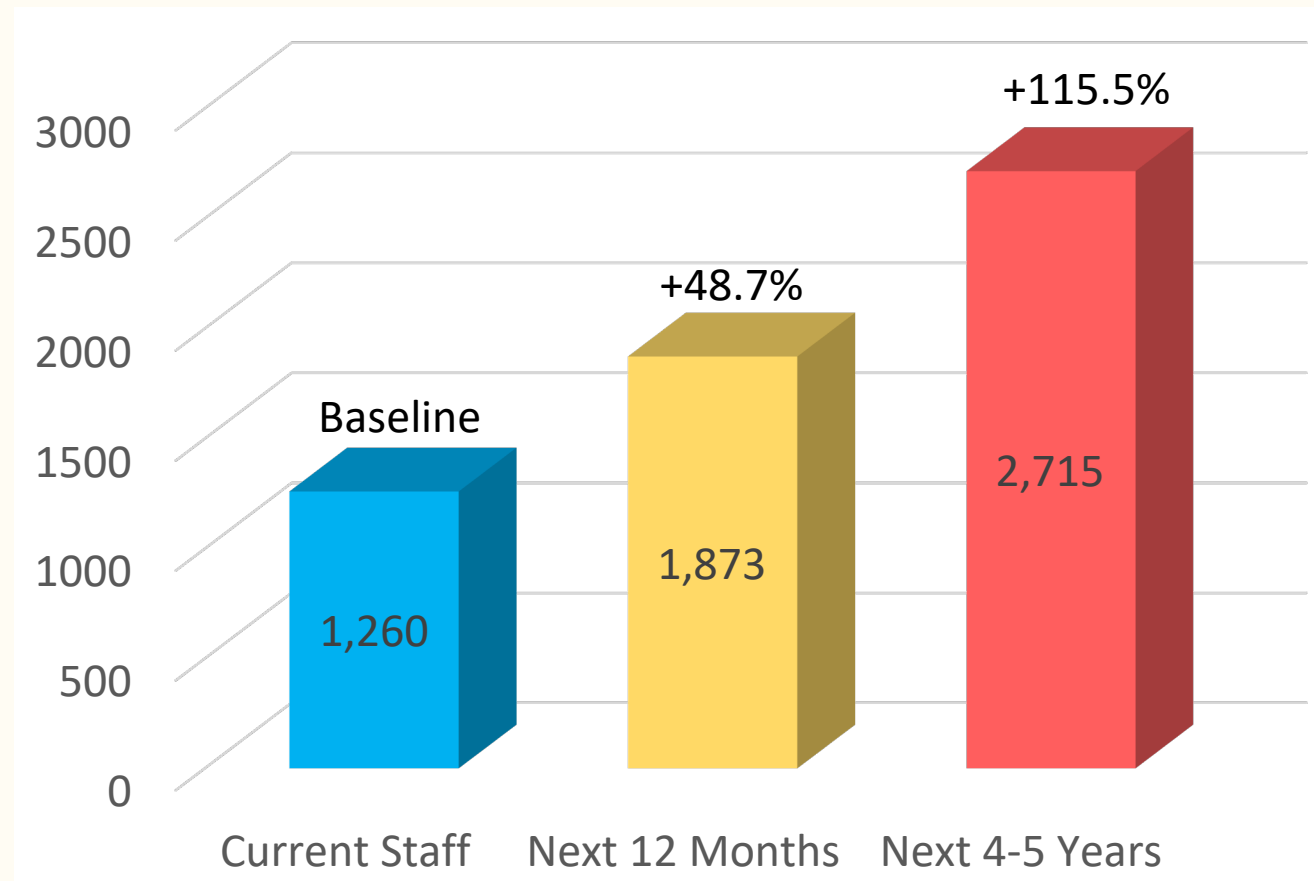


Staffing Challenges

Hiring Demand Surging!

- Based on our sample respondents:
 - Current Staff: **1260**
 - Next 12 Months: **613** new hires needed.
 - Next 4-5 Years: **1455** new hires needed.
 - Vacancies often take **6+ months** to fill

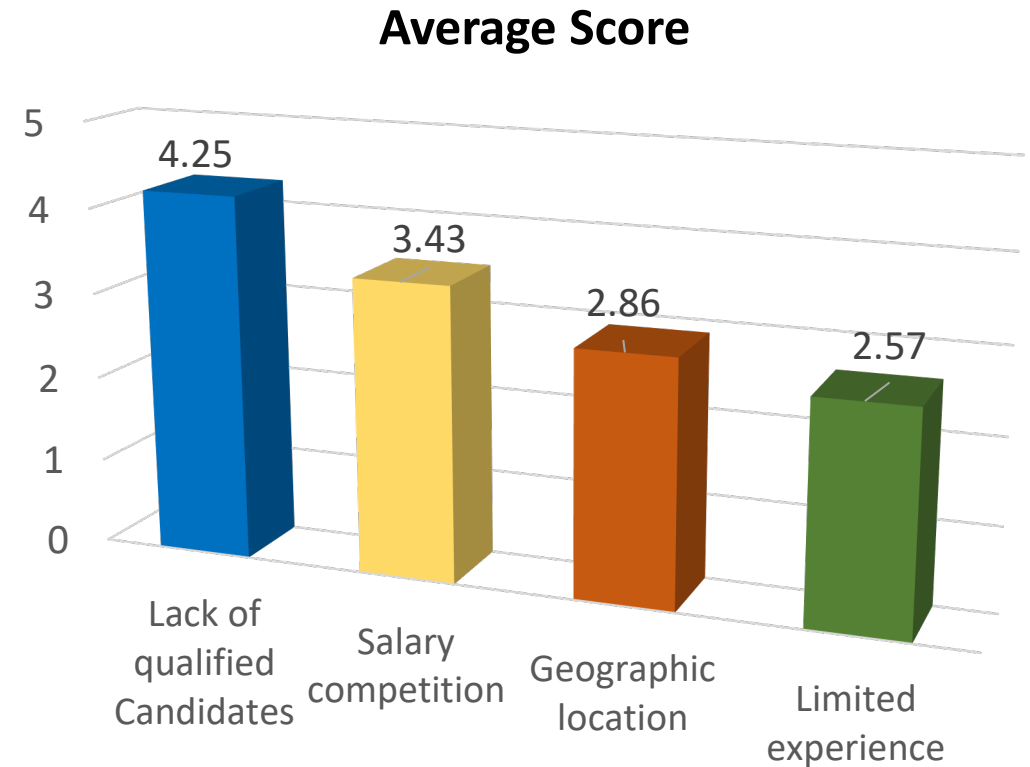
Total Workforce Needed



Recruitment Challenges

Key Hiring Obstacles:

- Lack of qualified candidates
- Salary competition



83% of respondents say local education programs do not fully produce graduates with the needed skills!

Impacts of Staff Shortage

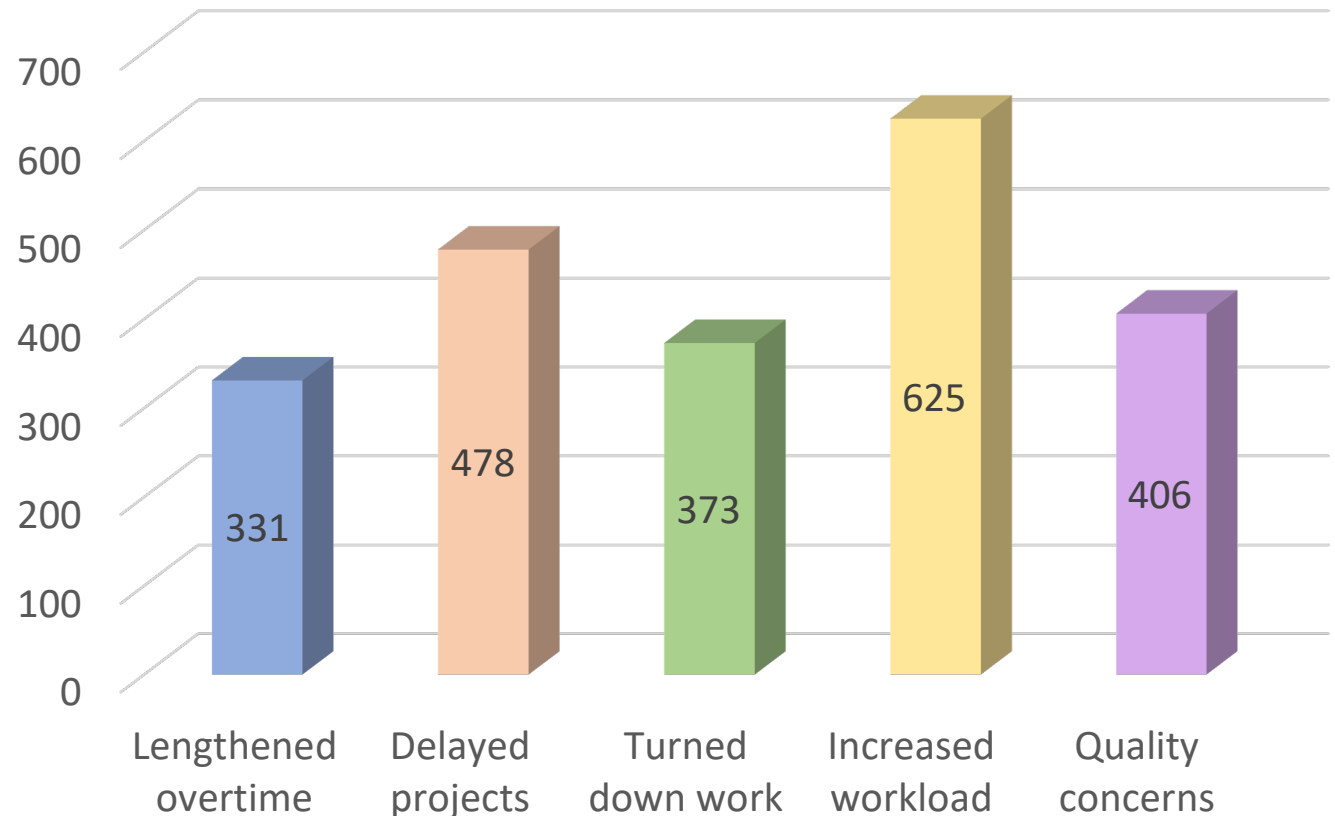
Key Impacts of staff shortage on Work

- Increased Workload
- Delayed Projects
- Quality Concerns
- Outsourcing tasks or projects

Critical Areas Affected

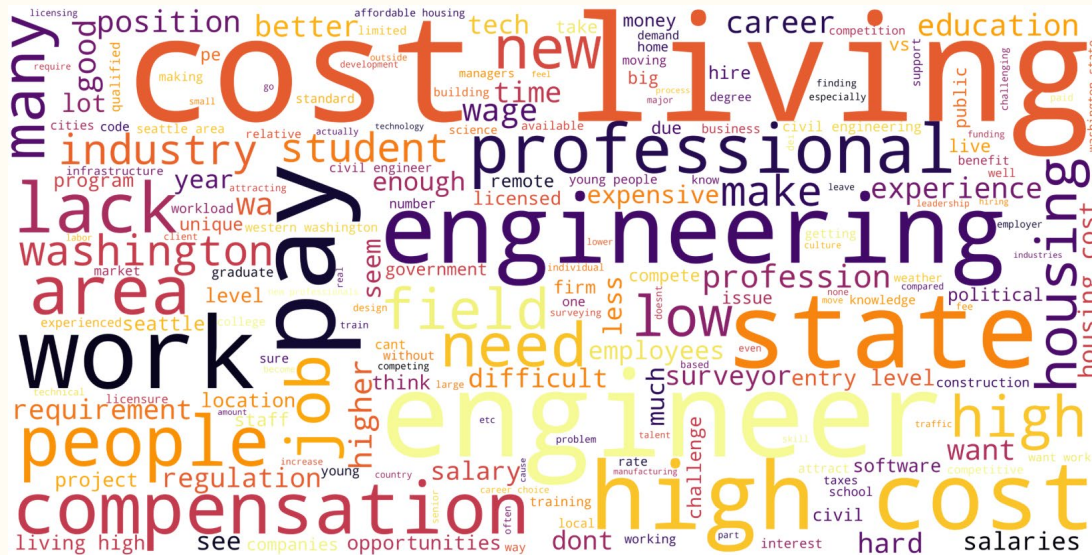
- Project Management
- Quality Control
- Construction Oversight
- Site Inspection
- Development Planning and Design

Impact of Staffing on Work



Engineering Pathway Study

- Financial challenges due to expensive housing and living expenses.
- Wage expectations vs. regional cost of living
- The high barriers to entry and limited career progression
- Competition from the booming sectors

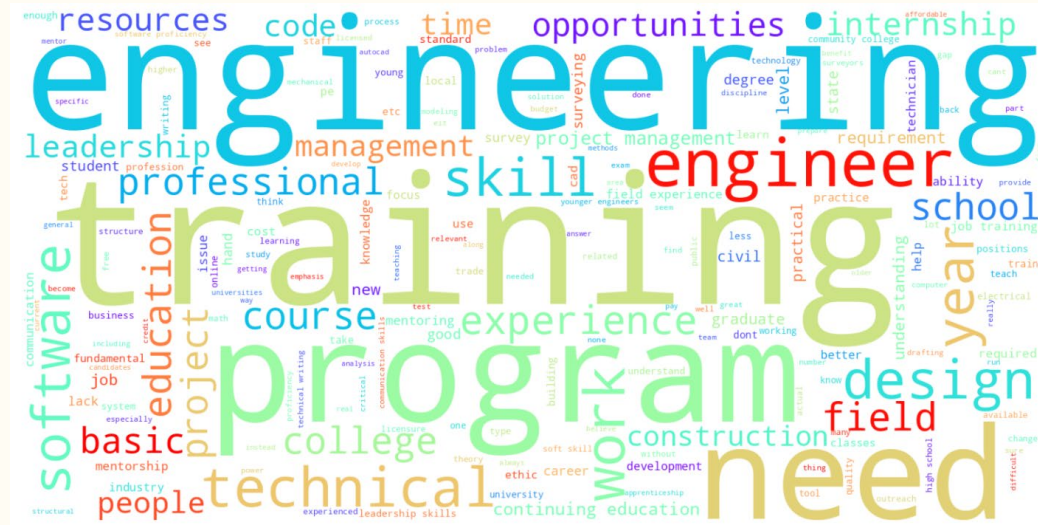


- Retirement!
- Inadequate Compensation and Benefits
- Workload strain due to understaffing
- Limited opportunities for Advancement
- Leadership and Workplace Culture Issues

- Soft Skills & Communication
- Field Experience
- Critical thinking & Technical Skills
- Work ethic and time management



- Leadership Skills
- Project Management
- Limited Proficiency in Modern Software/Technology
- Mentoring & Training for Younger Staff
- Advanced Writing & Interpersonal Communication



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Solutions for Workforce Challenges



- **Enhanced Education and Training Programs:** Aligning courses with the practice needs



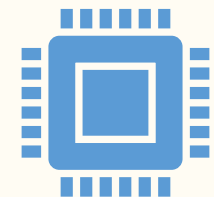
- **Apprenticeship Programs:** Offering hands-on training and mentorship

- **Expanded Outreach:** Engaging high schools and community colleges

- **Leadership, Soft Skills & Communication:** Training to address interpersonal skill gaps

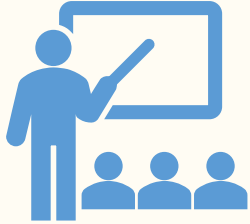


- **Generational Challenges:** Adapting to younger engineers' expectations



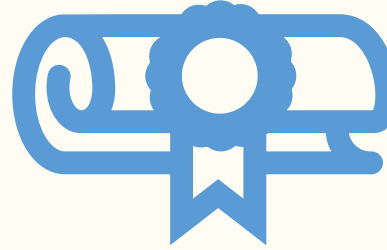
- **Hands-On & Non-Traditional Pathways:** Providing practical, on-the-job experience

Recommended Actions



• Short-Term Training Programs

- Address skill gaps (e.g., CAD, GIS, modeling, programming).
- Include licensing prep (PE, EIT) and leadership training.
- Meet immediate workforce needs with focused, practical courses.



• Enhance Local Educational Programs

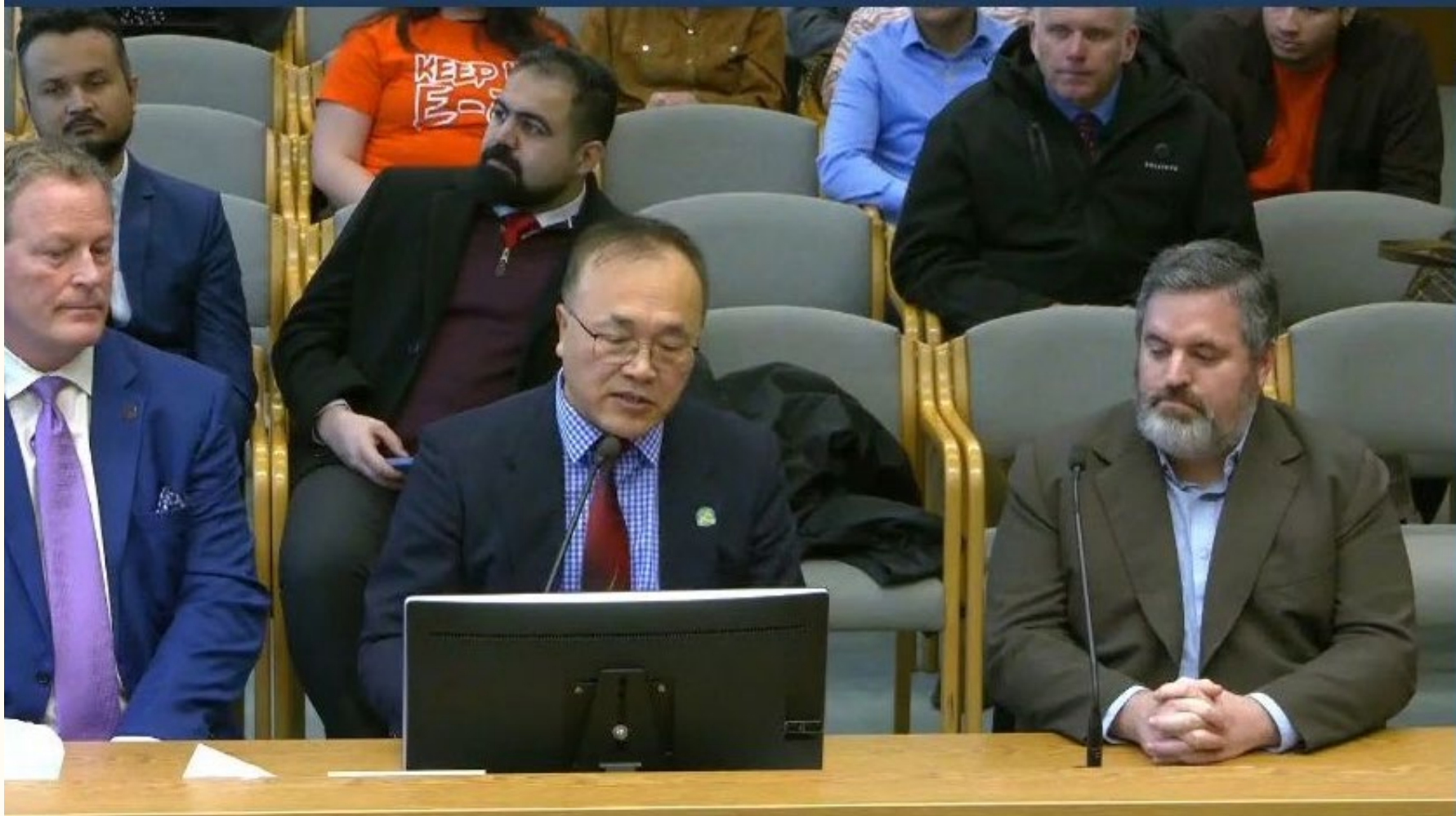
- Expand capacity in civil engineering and related fields (UW, WSU, etc.).
- Support programs like the WSDOT Fellow for advanced degrees.
- Increase funding for engineering, surveying, and related programs.
- Update curricula to match evolving technologies.



• Internships & Outreach

- Offer more apprenticeships and internships for real-world experience.
- Expand summer intern and high school outreach, especially in rural or underrepresented areas.
- Ensure graduates are job-ready upon hiring.

Senate Transportation Committee



Feb. 24, 2025 at the Washington State Senate Transportation Committee Meeting

PacTrans Region 10 Conference



October 6, 2023 PacTrans Region 10 Transportation Conference at the UW



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