

Building a More Diverse Skilled Workforce in the Highway Trades: Are Oregon's Current Efforts Working?

Final report
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Sarah Burd-Sharps and Kristen Lewis
Measure of America

Maura Kelly
Portland State University

Executive Summary

Jobs in the highway construction trades have historically been primarily held by white men and largely remain so today; of those completing apprenticeships in the highway trades in Oregon between 2011 and early 2014, 83.4 percent were white men. Building a more diverse skilled workforce and making careers in these trades more accessible and appealing to women and people of color has proven challenging.

The state's Bureau of Labor and Industries (BOLI), in collaboration with the Oregon Department of Transportation (ODOT), in 2010 began a statewide effort—the Highway Construction Workforce Development Program—to find, train, and employ a diverse workforce for highway construction jobs throughout the state. The program provides mentoring and four services designed to help workers overcome commonly identified barriers to participation in the heavy highway trades: financial support for childcare; fuel assistance; support for tools, clothes and other required equipment; and overnight travel expenses for jobs.

This paper provides the findings of an assessment of these efforts using data on trends in the Oregon heavy highway workforce from the Oregon Apprenticeship System, a phone survey of current and past highway apprentices conducted in early 2014, and a review of the experiences of others states in this area.

An important finding of the survey analysis was that, among respondents who received BOLI-ODOT financial and social supports, large majorities reported that they found them “very helpful”. In fact, nearly three-quarters of service recipients (72.5 percent) reported that BOLI-ODOT supports allowed them to take jobs they otherwise would not have been able to take. Furthermore, the analysis found that receiving BOLI-ODOT financial services was also associated with higher completion rates for women, a group currently underrepresented in the heavy highway trades. Women apprentices in eligible trades who received financial support services had a completion rate of almost 61 percent, nearly twice the rate of women apprentices who did not receive any services (31.5 percent).

Another set of findings was the identification of key challenges apprentices face. Childcare topped the list; 76.7 percent of apprentices who needed paid childcare identified this as a problem. Second were financial challenges; for instance, experiencing periods with no work was reported to be a problem for 56.6 percent of apprentices surveyed, and roughly half reported that purchasing tools, clothing, and personal protective equipment was problematic. After childcare and financial challenges, a workplace culture of hostility and disrespect emerged as a major theme in the survey. Hostile behaviors included discrimination and harassment on the basis of gender and race and ethnicity, but also on the basis of sexual orientation, age, and inexperience in the trades more generally. Nearly seven in ten women (68

percent) reported experiencing discrimination or harassment of some kind during their current or most recent apprenticeship, as did 28.1 percent of men responding to the survey.

The paper concludes with a set of recommendations for creating a more diverse skilled workforce in the highway trades. These recommendations include the following:

Take action to improve workplace culture. Everyone has the right to be treated with fairness and respect on the job, regardless of gender, race and ethnicity, sexual identity, age, or level of experience. More needs to be done to bring workplace cultures and behavioral norms in step with twenty-first century standards and expectations.

Improve access to affordable, reliable, high-quality childcare for Oregon's low-income parents. The Oregon Department of Transportation should consider joining with unions as well as with other state departments in sectors that depend on a workforce drawn heavily from low-income communities to make the case for affordable childcare. Low-income and even middle-income parents in Oregon have a dearth of quality childcare options they can afford, a situation limiting the ability of parents, particularly mothers, to participate in a field like highway construction that requires long days and overnight travel.

Improve awareness of BOLI-ODOT supportive services. BOLI-ODOT support services are highly valued, yet many who could use them are not aware of them.

Expand recruiting activities to workers in their 20s and 30s. Recruitment efforts currently focus largely on youth ages 16-24. Given that the average new female apprentice of color is 36 years old (whereas the average new white male apprentice is 28 years old), increasing diversity will depend upon an expanded outreach strategy.

Strengthen and expand pre-apprenticeship and mentoring programs statewide. The survey revealed clearly that pre-apprenticeships are an effective conduit for women entrants into highway trade apprenticeships. Fully half of the female apprentices surveyed had participated in such a program.

Set up a resource center to help connect apprentices with other opportunities during out-of-work periods. Most BOLI-ODOT supportive services are available only while apprentices are working or in classes. BOLI-ODOT should consider supporting the creation of a resource center to connect apprentices with mentoring and case management services and to coordinate with other organizations to place apprentices in temporary jobs or volunteer positions during the slow winter months.

Ensure all apprentices have equal opportunities for on the job training. Lack of opportunities for work was particularly problematic for women and people of color and is contributing to their overall lower rates of completion. Apprenticeship programs must ensure that all apprentices have equal opportunities to access jobs and minimize the degree to which employment is contingent upon personal relationship and networks.

Explore ways to ensure that the limited funds available through the Highway Construction Workforce Development Program are used most effectively. The purpose of the program's financial supports is to ensure that apprentices who would not be able to participate in and complete their apprenticeships are able to do so. Channeling funds to those who would complete the program without such support is not a strategic use of limited resources.

Improve data collection on current and past apprentices. Assessing the cost effectiveness of different services and interventions requires good data. The paper makes several concrete recommendations for improved data collection.

INTRODUCTION

Oregon's highways connect cities and towns across the state's vast geographic expanse and pave the way for commuters to get to work, goods to reach markets, and visitors and residents alike to experience the state's beautiful and varied landscape. Everyone in the state depends on adequate, well-maintained highways, and, by extension, on a skilled, stable, and sufficient highway workforce. Yet there are many barriers to entering and remaining in the highway construction trades, especially for women and minorities, limiting the potential pool of skilled workers for this critical sector.

Highway work is physically demanding, and road construction sites present numerous dangers¹; while these are perhaps the most visible barriers to the job, they are not the only ones. The seasonal schedule means long periods of unemployment, creating serious financial challenges for workers in cold-weather months. Job sites can be far from workers' homes, and shifts sometimes stretch well beyond standard working hours, making it hard for workers to meet their childcare and other family responsibilities. And this line of work is not typically perceived or experienced as being open and hospitable to everyone. Highway construction trades, such as carpenter, laborer, or electrician, have historically been the purview of white men and largely remain so today; of those completing apprenticeships in the highway trades in Oregon between 2011 and early 2014, 83.4 percent were white men. For all these reasons, building a more diverse skilled workforce and making careers in these trades more accessible and appealing to women and people of color has proven challenging.

Increasing workforce diversity in this sector is a priority from the perspective of fairness and equal opportunity, opening to women and minorities a line of work that is far more lucrative than other occupations that don't require a college degree, particularly those dominated by women, such as childcare provider or home health aide. It is also important for pragmatic reasons: it is estimated that the heavy highway trades in Oregon will be hiring over 10,000 new workers in the next ten years.² To both meet demand for new workers and increase workforce diversity, the state's Bureau of Labor and Industries (BOLI), in collaboration with the Oregon Department of Transportation (ODOT), in 2010 began a statewide effort—the Highway Construction Workforce Development Program—to find, train, and employ a diverse workforce for highway construction jobs throughout the state. BOLI-ODOT designed a series of initiatives to enlarge the pool of qualified female and minority applicants and to connect

¹ Pegula, 2004.

² Authors' analysis of data from the Oregon Labor Market Information System, Occupational Information Center, 2014.

apprentices with programs and services designed to help them succeed in highway apprenticeships and ultimately enter into careers as journey workers.

The Highway Construction Workforce Development Program is now in its fourth year of implementation. Working through Cooper Zeitz Engineers, Inc. and Oregon & Southern Idaho Laborers, BOLI and ODOT have focused on the pipeline stage, funding four types of services plus a mentoring program for apprentices. The four services are designed to help workers overcome commonly identified barriers to participation in the heavy highway trades and include the following: financial support for childcare; fuel assistance; support for tools, clothes and other required equipment; and overnight travel expenses for jobs. These supportive services have been publicized through mailings, jobsite notices, and word-of-mouth. The Highway Construction Workforce Development Program is an innovative example of best-practices in workplace development and diversity programs. Use of the program services is robust, and apprentices who make use of them find them quite helpful. In fact, nearly 73 percent of program beneficiaries surveyed reported that these services allowed them to take jobs they otherwise would not have been able to accept.

This paper provides the findings of an assessment of these efforts using data on trends in the Oregon heavy highway workforce from the Oregon Apprenticeship System (OAS), a phone survey of current and past highway apprentices conducted in early 2014, and a review of the experiences of others states in this area. Specifically, this paper aims to explore the following questions: Has the recruitment and retention of women and people of color in apprenticeships increased, and which supportive services are most valued by recipients and most helpful in promoting retention and diversity in the workforce? The report concludes with a set of recommendations for improvements to the Highway Construction Workforce Development Program and a proposal for indicators to be included in a Performance Measurement System to continue to track progress on the program in the coming years.

CHALLENGES OF WORKFORCE DIVERSIFICATION IN THE HEAVY HIGHWAY TRADES

Statistically, the workforce in the heavy highway trades, like the workforce in the construction industry more broadly, has long been overwhelmingly male (see Box 1 for a list of heavy highway trades). Some social scientists refer to these industries as “socially marked as masculine”³—meaning that society tends to perceive them as better suited to men than to women. Evolving gender norms have challenged these assumptions, but women remain a distinct minority in this sector, comprising less than 3 percent of construction workers nationwide.⁴ People of color also have been historically underrepresented among apprentices and journey workers in these trades. In Oregon in recent years, however, the share of people of color among new apprentices in the heavy highway trades has risen to become roughly proportionate to their share of Oregon’s population, about 22 percent.⁵ But while the enrollment rates of apprentices of color have increased, their completion rates lag those of their white counterparts considerably.

Work in the heavy highway trades poses challenges for all apprentices. For those caring for children, long hours, job sites far from home, and irregular schedules present particular hardships. Long periods of layoff over the winter can stress family budgets. The cost of tools, protective gear, and required classes can stretch household finances thin. Added to these challenges is a workplace culture that too often is characterized by hostility and harassment on the basis of gender, race and ethnicity, sexual identity, age, and level of experience. For women, being the only woman on a job site can create a sense of isolation; a 2013 survey of construction tradeswomen by the Institute for Women’s Policy Research found that one in four women reported that there is never another woman

Box 1. What Are the Heavy Highway Construction Trades”?

This report focuses on apprentices learning trades involved in building and maintaining highways, roads, and bridges in the state of Oregon. The table below lists these trades as well as the number of workers currently employed and median hourly wages in each.

Trade	Employment (2012)	Median Hourly Wage (2012)
Bricklayers	460	\$28.21
Carpenters	9,124	\$20.50
Cement Masons	1,620	\$21.89
Construction Equipment Operators	3,256	\$24.31
Electrician	7,270	\$33.68
Ironworkers	387	\$29.97
Laborers	8,073	\$16.49
Painters	3,306	\$16.81
Plumbers	3,631	\$32.59
Sheet Metal Workers	2,631	\$23.99
TOTAL	39,758	-

Source: Authors’ analysis of data from the Oregon Labor Market Information System, Occupational Information Center, 2014.

³ Duke et al. 2013.

⁴ Figure reflects women as a percentage of all workers in the construction and extraction occupations. Bureau of Labor Statistics 2013.

⁵ Authors’ analysis of data from the U.S. Census Bureau, American Community Survey 2012.

with them on a job.⁶ As will be discussed below, the phone survey revealed that hostile and intolerant workplace environments are common. The extent to which bullying and harassment are experienced suggests not only that a hostile work environment is a major impediment to the recruitment and retention of women and people of color, but also that apprentices in general experience unacceptable levels of hostility and disrespect.

It is important to note that the lack of diversity in the heavy highway trades is not unique to Oregon, or even to the US more broadly. The barriers to women in particular are a source of concern in other countries as well; the UK and Australia, for instance, have sought to address them in various ways, such as efforts to reform the construction workplace culture with a zero-tolerance approach to expressions of disrespect of all sorts and the issuing of “yellow cards,” as in soccer, on the spot for inappropriate behaviors.⁷

Within the US, many other states face this challenge and are taking steps to build a more diverse workforce. These efforts provide some promising practices that could be replicated.

For example, some state governments have incentivized contractors to hire female apprentices and apprentices of color by reimbursing them for part of the hourly wage paid to these workers. This approach is used by the Departments of Transportation in both Illinois and South Dakota, with reimbursement rates varying from \$3 in South Dakota to \$15 in Illinois.⁸ Illinois further rewards contractors and subcontractors with credits to be used towards future bids on state construction projects if they hire from a selected pool of female, minority, veteran, and former offender job applicants.⁹ Another set of approaches focuses on recruitment efforts with teenagers and young adults in settings like high schools to encourage young people to start thinking about careers in the highway trades early. Minnesota practices this “early exposure” approach and follows it up with highway trade internships and apprenticeships directly from high school. Finally, Minnesota is an example of a state with concrete diversity goals: the state has committed to developing long-term plans to meet a 32 percent goal of people of color and a 6 percent goal of women in the highway trades in select Minneapolis-St. Paul metro area counties.¹⁰

⁶ Hegewisch and O’Farrell, 2014.

⁷ Peters, 2010.

⁸ South Dakota Department of Transportation, 2014; Illinois Department of Transportation, 2014.

⁹ Illinois Department of Transportation, 2014.

¹⁰ Minnesota Department of Transportation, 2012.

In Oregon ODOT has employed some of these approaches. For instance, ODOT has set aspirational targets of having 14 percent of construction hours worked by women and 20 percent by minority workers in the Portland metropolitan area counties of Clackamas, Multnomah, and Washington Counties. Furthermore, it requires that 10 percent of all hours on construction sites be completed by apprentices, regardless of gender or race and ethnicity.¹¹ Setting concrete, time-bound goals creates greater accountability for results than unspecific promises however, no matter how sincere they may be.

In addition, BOLI-ODOT has sought to build a more diverse pipeline of applicants for apprenticeships by supporting pre-apprenticeship programs. These programs are designed to help people build the necessary skills to meet the minimum entry qualifications to enter a trade or apprenticeship program. Pre-apprenticeships can help to reach not only women and people of color, but also people without family or friends in the trades, a common conduit for employment in this sector. BOLI-ODOT actively funds several pre-apprenticeship programs, including those operated by Oregon Tradeswomen, Constructing Hope, and Portland Youthbuilders (see Box 2 for more about programs). Evening Trades Apprenticeship Preparation (ETAP) was a part of these programs in the past, but is no longer functioning.

About one in five apprentices (20.4 percent) who responded to the survey reported that they had completed a BOLI-recognized pre-apprenticeship program, with women far more likely than men to have done so. Half of the female apprentices surveyed completed some sort of pre-apprenticeship program, compared to only about 11 percent of men. A majority of BOLI-recognized pre-apprenticeships were completed through Oregon Tradeswomen, Inc. with other

Box 2: Examples of Pre-Apprentice Programs in Oregon

Oregon Tradeswomen, Inc.

Between March 2011 and February 2014, 238 women graduated from the Oregon Tradeswomen pre-apprenticeship program.

In the year between July 1, 2013 and June 30, 2014, 83 OTI program graduates became employed; 47 entered registered apprenticeships; and 30 entered other trades careers. Twenty-nine percent of placements were women of color.

For more information: www.tradeswomen.net

Constructing Hope

Between March 2011 and February 2014, 141 people graduated from the Constructing Hope.

In 2013, a total of 19 pre-apprenticeship program graduates entered registered apprenticeships. The majority were women and people of color.

For more information: www.constructinghope.org

¹¹ Oregon BOLI, 2011.

programs accounting for much smaller shares of enrollment (see table below).

Table 1. Pre-apprenticeships Among Survey Respondents

ORGANIZATION	PRE-APPRENTICESHIP PROGRAM (%)
Oregon Tradeswomen Inc	57.5
Jobs Corps	16.0
Constructing Hope	10.4
Portland Youthbuilders	6.6
ETAP	4.7
Portland Community College	2.8
B-FIT/PCC Rock Creek	0.9
Youthbuild/B-FIT/Oregon Tradeswomen Inc	0.9

Source: Authors' analysis of apprentice survey data.

THE HIGHWAY CONSTRUCTION WORKFORCE DEVELOPMENT PROGRAM

BOLI and ODOT began implementing the Highway Construction Workforce Development Program in 2011. The goal was to make apprenticeships in the heavy highway construction trades more appealing to a diverse pool of applicants by providing targeted financial and social support services to help apprentices overcome some of the unique challenges of work in these trades.

The Highway Construction Workforce Development Program provides four types of financial supportive services to qualifying apprentices in the heavy highway trades. For the current July 2013-June 2015 budget cycle,¹² these services include:

- **Travel** – Reimbursement at 50 percent of the federal General Services Administration (GSA) rate for travel to and from jobsites and required classes. The maximum reimbursement is \$500 per apprentice.
- **Lodging/Per Diem** – Reimbursement at 100 percent of the federal GSA rate for lodging in a hotel or motel plus meals and incidental (per diem) expenses if traveling to a jobsite 60 miles or more from home. Any other assistance apprentices receive for lodging from other sources is deducted from the reimbursement. The maximum reimbursement is \$1,000 per apprentice.

¹² Services described here reflect program specifications for the July 2013-June 2015 budget cycle. Slight differences may exist between services provided through Cooper Zietz and the Laborers. Service availability and reimbursement limits have been adjusted periodically during the lifetime of the program, reflecting changes to the contracts with Cooper Zietz and the Laborers as well as program-wide spending restrictions which were in place between October and November 2011 and November 2012 to January 2013.

- **Daycare Support** - Financial support for childcare for eligible apprentices is given directly to a registered childcare provider. Eligibility and the level of support depend on the financial needs of the apprentice as well as the number and age of their dependent children. Support is capped at \$6,000 per apprentice.
- **Tools and Personal Protective Equipment (PPE)** – Financial support is made available for eligible apprentices to purchase tools, clothing, and equipment required for work in their trades. Support is capped at \$500 per apprentice.

Overall financial support to each apprentice for all services is capped at \$1,500 per month, for one or all of the services utilized.¹³

In addition to the four financial supportive services listed above, BOLI-ODOT also offers non-financial services, such as resource and referral assistance for career counseling and budgeting, referrals to social services, and mentoring.¹⁴ Both financial and non-financial services and supports are funded and overseen by BOLI-ODOT and are administered by Cooper Zietz Engineers, Inc. and Oregon and Southern Idaho Laborers. Additionally, Cooper Zietz, Laborers, Oregon Tradeswomen, Constructing Hope, and ETAP (now no longer participating) provide mentoring and other programs outside of work.

To qualify for these services, apprentices must be registered in one of the principal highway trades (equipment operators, carpenters, iron workers, laborers, cement masons, and painters) in Oregon, or be in a registered apprentice in another construction trade and actively working on a highway or bridge project. See Box 3 for a list of qualifying trades. In addition, they must be currently working as an apprentice or attending required classes or trainings. Other eligibility criteria apply also apply to specific services. For example, to receive childcare support, the apprentices must show that

Box 3: Who qualifies for BOLI-supported services?

All apprentices in these trades qualify for services:

- Carpenters (and allied trades)
- Cement Masons
- Ironworkers
- Laborers
- Operating Engineers
- Painters (since July 2013)

Few apprentices in these trades currently qualify for services, unless they are actively working on a transportation job:

- Electrician
- Plumber
- Sheet Metal Worker

¹³ This monthly limit applies only to apprentices receiving financial supports through Cooper Zietz.

¹⁴ Cooper Zietz, Inc., nd.

they are responsible for dependent children, and the level of reimbursement depends upon the number and age of those children. Gender and race and ethnicity are not considerations for determining eligibility.

Analysis of OAS data shows that financial support services, offered by BOLI-ODOT through Cooper Zeitz Engineering, Inc. and the Laborers, are used by only about 5 percent of apprentices, although this percentage rises to 14.5 percent among apprentices in eligible trades. Support services are not targeted at women and people of color, but both of these groups, and women of color especially, are more likely to receive support services than white men.

Table 2. Use of BOLI-ODOT Financial Support Services by Race/Ethnicity and Gender

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Received one or more BOLI-ODOT sponsored services (% in eligible trades)	14.5	13.3	24.5***	12.5	15.3	20.8	34.5*

Source: Authors' analysis of OAS data. Significant differences from chi-square tests are flagged as follows: *p<.05, ***p<.001.

Among apprentices who received any services, there were large variations in the use of the four individual financial supports. Nearly seven in ten (69.2 percent) service recipients got support for tools and protective equipment, while only about one in eight (11.8 percent) obtained support for childcare. All apprentices need tools and gear, but not all have dependent children requiring childcare, so these simple differences in need may of course explain some of this variance. However, differing patterns in the use of the four services, summarized in the table below, are striking.

Table 3. Use of BOLI-ODOT Financial Support Services by Service Used

	Childcare	Lodging/Per Diem	Fuel	Tools/Equipment
Received (% among apprentices receiving any financial supports)	11.8	37.3	52.7	69.2

Source: Authors' analysis of OAS data. Universe: apprentices who received at least one financial support service.

Although women, and especially women of color, were more likely than men to be recipients of financial support services in general, these patterns are not always present when looking within the pool of

apprentices receiving each individual service. Women and men, and apprentices who are people of color and white, were all equally likely to be making use of support for lodging/per diems and tools and PPE for example. Male apprentices were more likely to receive support for fuel than female apprentices.¹⁵ The most striking patterns emerged within the pool of apprentices receiving support for childcare, despite this service being the least commonly utilized of the four. One-third (33.3 percent) of women of color receiving any support got support for childcare, followed by 13.5 percent of men of color, 10.3 percent of white women, and 9 percent of white men.

Receiving financial support services is associated with better completion outcomes for women. Women apprentices in eligible trades who received financial support services had a completion rate of 60.9 percent, nearly twice the rate of women apprentices who did not receive services (31.5 percent).¹⁶ There were no significant differences, however, between the completion rates of men and apprentices of color who received services and those who did not, or between parents who did and did not receive services. Tests were also run on data for service recipients to see if the dollar value of all supports received or the number of financial services utilized had any association with completion. No significant associations were found. Finally, we looked at whether or not apprentices who completed a pre-apprenticeship and received financial support services had better completion outcomes than other apprentices. Completion among the very small number of apprentices in eligible trades who had completed a pre-apprenticeship program and used any financial support services (n = 8) was not significantly different from completion among other apprentices. It should be noted however that the number of service recipients in the OAS data is relatively small, especially when including other factors such as gender or race in the analysis, making any trends that may be present in the data difficult to detect statistically. The lack of more positive associations between service use and apprenticeship completion suggest only that the tests are currently inconclusive. These tests should be repeated in years to come when data for more apprentices are available for analysis.

¹⁵ The percentages were 55.4 percent of male apprentices receiving any financial supports received travel reimbursements compared to 40 percent of women. Chi-square test significant at $p < .05$.

¹⁶ This finding is based on a bivariate chi-square test (significant at $p < .05$) that does not take any additional factors that may also have an association with completion into account. We note however that the positive association between financial service receipt and completion rates among women in eligible trades does persist once controls for factors such as race, age, and educational attainment are introduced in a linear regression model for estimating the likelihood of completion compared to having an apprenticeship agreement terminated.

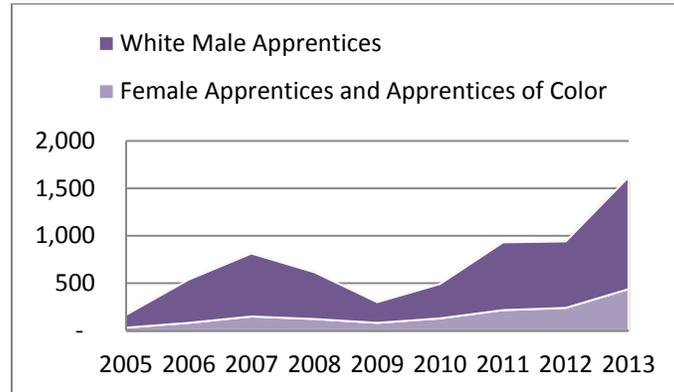
Non-financial social support services, such as mentoring, networking, and case management, were used by fewer than 2 percent of apprentices in the OAS database but there were small but significant differences by gender and by race and ethnicity among the service-users. Most prominently, women are far more likely than men to take advantage of these services, in part because Oregon Tradeswomen Inc., one of the major providers of social support services for apprentices, serves only women. Over 8 percent of female apprentices have used social support services, compared to only 1.2 percent of men. Male apprentices of color are also more likely than white male apprentices to use these services. Nearly 10 percent of women of color used social support services, compared to 8 percent of white women, about 3 percent of men of color, and less than 1 percent of white men.

WORKFORCE DIVERSITY TRENDS IN OREGON’S HEAVY HIGHWAY TRADES

The total workforce in Oregon’s heavy highway trades is just under 40,000 people. The ten principal trades that we refer to as the “heavy highway construction trades” are listed in Box 1 on page 4. They range from trades with over 9,000 active workers like carpenters to trades with fewer than 400 active workers like ironworkers. Median hourly wages in these trades range from \$33.68 per hour for electricians to \$16.49 per hour for laborers.¹⁷ The number of new apprentices each year in the heavy highway construction trades has fluctuated greatly along with the fortunes of the national economy, but in 2013, over 1,600 entered the program, bringing the total number of active apprentices for that year to 2,372. If apprentices who either completed, moved, or terminated their apprenticeship agreements are included, the sum of apprentices active at any point in 2013 rises to 3,122. Female apprentices and apprentices of color accounted for 16.5 percent of new apprentices in 2005, a share that then rose 26.9 percent in 2013, an increase of about 50 percent over the period 2005–2013. These recent trends are evidence of important progress, although white men continue to comprise the overwhelming majority of new apprentices. Over the period 2005 to 2013, at least 73 percent of new apprentices each year have been white men.

¹⁷ Authors’ analysis of data from the Oregon Labor Market Information System, Occupational Information Center, 2014.

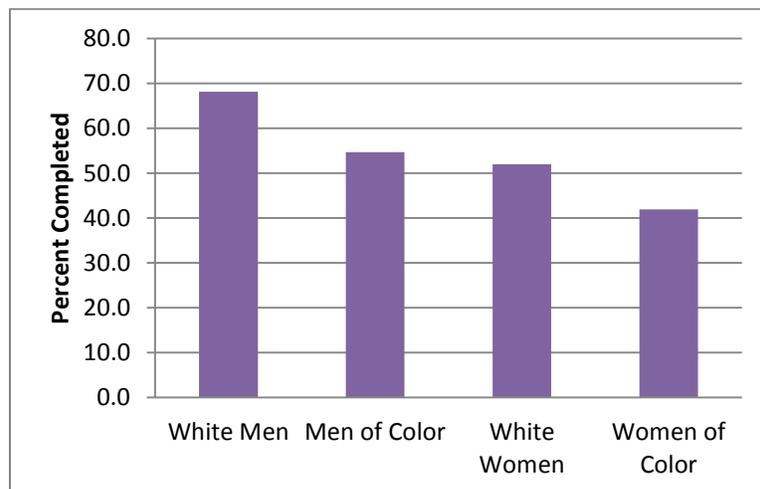
Figure 1. New Apprentices in Oregon Heavy Highway Construction Trades by Race and Gender, 2005-2013



Source: Authors' analysis of OAS data on all new apprentices not cancelling with 0 credits by year of indenture.

While progress has been made on diversifying the pool of new entrants, completion of apprenticeships has been stuck in neutral. OAS data analyzed for this report include records for apprentices in the 2005 to 2013 cohorts who were active between March 1st 2011 and January 31st 2014. Among apprentices in the OAS data who either completed or terminated apprenticeship agreements between early 2011 and early 2014, white men were the most likely to have finished successfully with 68.1 percent completing apprenticeships. Among white women, this figure was 54.7 percent and among men of color, 51.9 percent. Women of color were the only group more likely to quit or be terminated than to complete apprenticeships, with a completion rate of only 41.9 percent.

Figure 2. Apprenticeship Completion by Race and Gender, 2011-2014

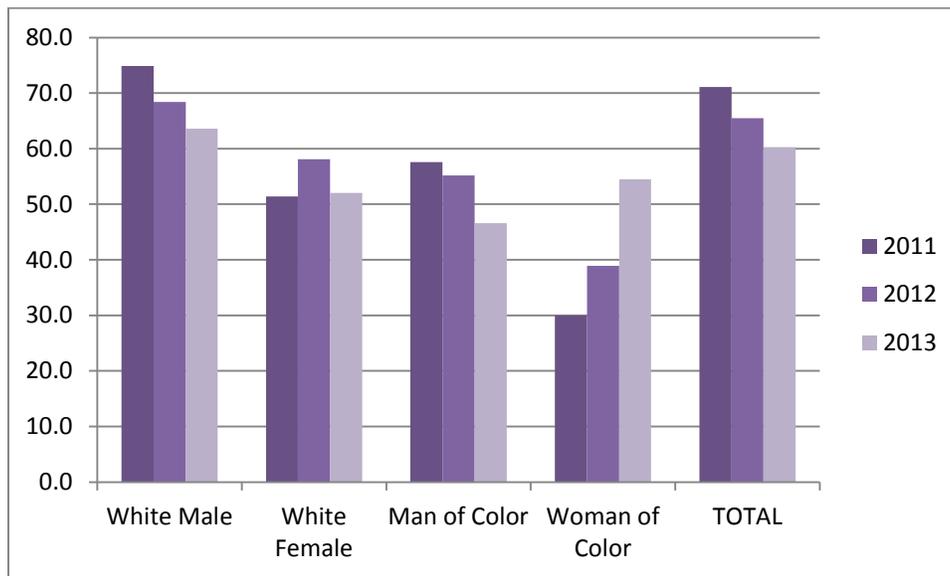


Source: Authors' analysis of OAS data for apprenticeships completed or terminated in 2011, 2012, 2013, or January of 2014.

Looking at the most recent years individually, 2011 to 2013, OAS data show some change in completion rates. Overall, the share of apprentices completing their apprenticeships has edged down every year since 2011, reflecting a trend among white male apprentices, who constitute the largest single group. Still, in 2013 about 64 percent of white men who ended apprenticeships did so by successfully completing one. This completion rate was higher than that among white women and apprentices of color. Women of color have made the most progress in terms of completion, however. More than half of women of color finished an apprenticeship successfully in 2013, compared to fewer than one in three in 2011.¹⁸ Major challenges remain in retaining women and people of color through to the successful completion of their apprenticeships.

“It’s just an ‘old boys club’ with the way it works. What I learned in construction is that white guys want to be with other white guys and guys from their same neighborhood. It’s not a matter that they dislike any certain group, it’s just that they like to be with each other. It seems like race and culture have more to do that merit in the trade I was in.” (African American male respondent, terminated)

Figure 3. Apprenticeship Completion by year, by Race and Gender, 2011-2013



Source: Authors’ analysis of OAS data for apprenticeships completed or terminated in 2011, 2012, or 2013.

¹⁸ Some caution should be taken with the completion rate for women of color due to the very small share of apprentices (1.4 percent, n = 92 in the OAS data) they represent.

KEY SURVEY FINDINGS

Between March 19th and 31st, 2014, a phone survey was conducted by the Portland State University Survey Research Lab to evaluate the use of BOLI-ODOT supportive services and the reasons for success or non-completion. The survey reached 519 current and past apprentices who had been active between March 1, 2011 and January 31, 2014. (For full details on the survey, see the Methodological Note.) The key findings are summarized below.

Table 4. Basic Characteristics of Current and Past Apprentices Surveyed

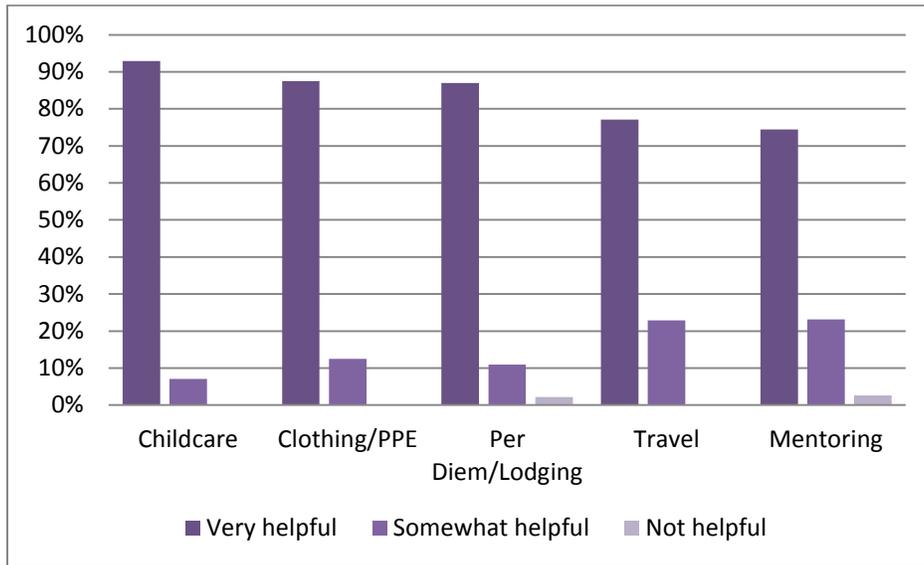
CHARACTERISTIC	% OF RESPONDENTS
Total Number Surveyed	519
Currently enrolled/competed/left without completing	67.2% / 19.3% / 13.5%
Male/Female	75.3 / 24.7%
White/People of Color	48.4% / 51.6%
Average age entering into apprenticeship	30
Married and Living with Spouse or Cohabiting with Partner	53.0%
At least one child under 18	51.4%
At least one child under 5	30.0%
Completed high school or GED/one year of college/a year or more of trade school	87.5% / 42.6% / 16.0%

Source: Authors' analysis of apprentice survey and OAS data.

Assessment of Services

An important finding of the survey analysis was that BOLI-ODOT supportive services were “very helpful” to recipients. Among respondents who received each type of support, large majorities reported that they found BOLI-ODOT financial and social supports helpful to them. Although used by the smallest number of apprentices, childcare support was rated most highly by those who used it, with nearly 93 percent saying they found it “very helpful”. Satisfaction with clothing/gear and per diem/lodging support, used by far more apprentices, was nearly as high. The only services that any apprentices reported any dissatisfaction with were per diem/lodging support and mentoring, although these responses were in the extreme minority. Men and women, and white apprentices and apprentices of color, were all roughly equally likely to have found these services helpful, if they used them.

Figure 4. Apprentice Evaluation of BOLI-ODOT Financial and Social Support Services



Source: Authors' analysis of apprentice survey data. Only respondents who received services were asked to evaluate how helpful they were.

Another very important finding was that many of those who used one or more of the services believed that the availability of these services was the deciding factor in their ability to pursue this career.

Specifically:

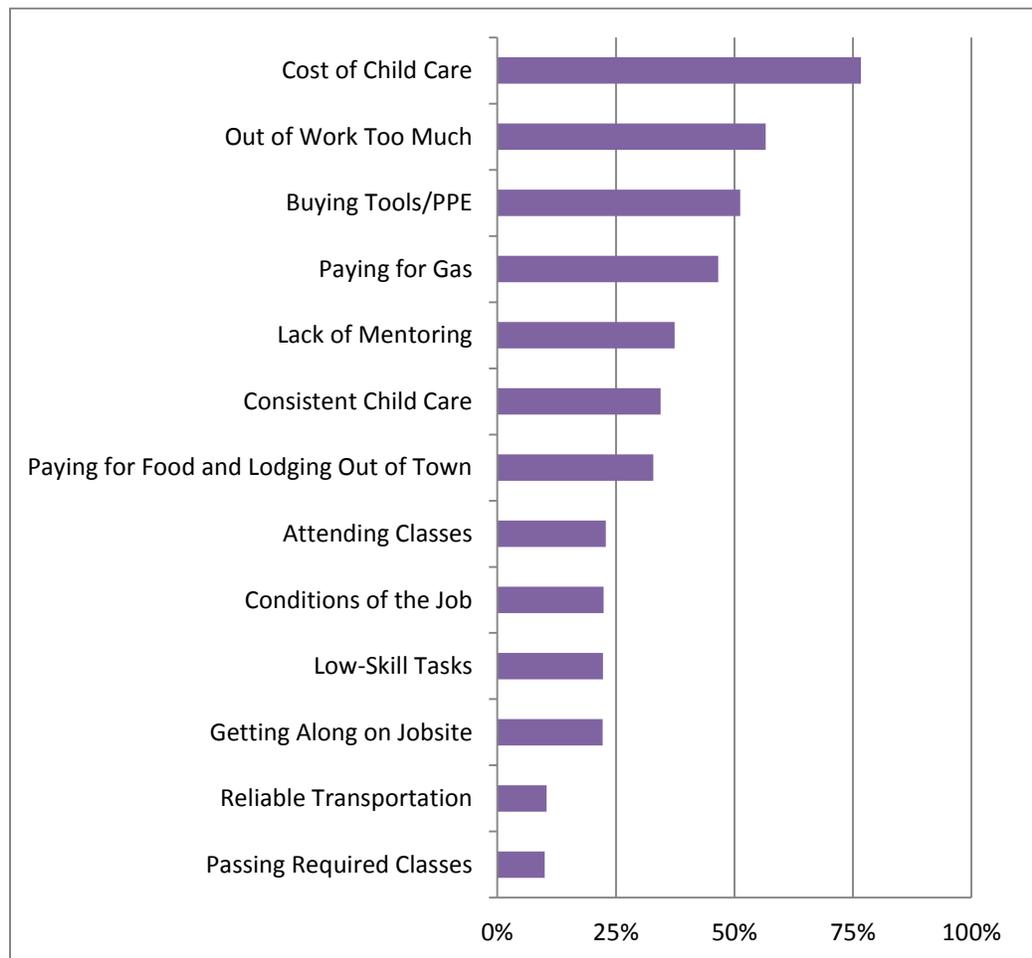
- More than seven in ten apprentices (72.5 percent) who used supportive services agreed that receiving these supports allowed them to take jobs they would otherwise have not been able to take.
- Among current apprentices using services, 37.5 percent responded they did not think they would be able to complete their apprenticeships without the supports.
- Among former apprentices who completed their apprentices and used services, 21.7 percent responded that they would not have been able to finish their apprenticeships without the supports.
- Women who were active apprentices and receiving services were somewhat more likely than men to say that these services allowed them to take jobs they otherwise would not have been able to take (80 percent compared to 71.3, respectively).¹⁹ Otherwise there were no significant differences in the ways that men and women or white apprentices and apprentices of color evaluated the ways these services impacted their careers in the heavy highway trades.

¹⁹ Chi-square test significant at $p < .05$.

Major Challenges Facing Apprentices

This section of the survey asked current and former apprentices about a range of challenges facing them on and off the jobsite. Childcare emerged first among the challenges apprentices face; 76.7 percent of apprentices who needed paid childcare identified this as either a “major problem” or “minor problem.” Second were financial challenges. For instance, experiencing periods with no work was reported to be a “major problem” or “minor problem” for 56.6 percent of apprentices surveyed, and roughly half (51.2 percent) reported that purchasing tools, clothing, and personal protective equipment was a “major problem” or a “minor problem.”

Figure 5. Challenges Apprentices See as Being a “Major” or “Minor” Problem



Source: Authors’ analysis of apprentice survey data. Items are presented in descending order based on the percentage of respondents indicating that a challenge was a “major problem” or a “minor problem”. For the purposes of this figure, these two responses were combined. Only apprentices with dependent children were asked questions about childcare.

Childcare Costs and Access

Both childcare costs and childcare access posed challenges to apprentices who were parents. Three in four reported that childcare costs were a major or minor problem, and one in three apprentices with children under age 18 reported that finding consistent childcare was a major or minor problem.

Because accessing and paying for childcare was challenging for such a high share of apprentices with young children, it is important to assess the groups most affected and the solutions families are finding. About half of those surveyed had one or more children under 18 living with them at the time of their apprenticeship, with men more likely than women to have children living in their home—55.2 percent of men compared to 39.8 percent of women. Drilling down further on children’s ages, about 59 percent of apprentices who were parents, or about 30 percent of all apprentices, had a child or children under the age of 5. Again, male apprentices were more likely than female apprentices to report being responsible for a young child. Roughly ninety percent of apprentices with kids reported that their children lived with them full-time (both during their apprenticeships and at the time of the interview, if different). Given that women are more likely than men to be custodial parents in the wider society, particularly among low-income groups, the gender disparity among respondents reporting being responsible for a young child is striking; the fact that more male than female apprentices report having children is evidence that women with children are particularly unlikely to see a career in the highway trades as appealing or possible.

While at work, apprentices with children relied mostly on their partners or family and friends for childcare. Only about 30 percent reported using paid care inside or outside their home. The table below shows a breakdown of the different childcare arrangements used.

Table 5. Childcare Arrangements Used Most During Apprenticeships

CHILDCARE ARRANGEMENT	%
Spouse or partner cares for them	41.7
Friend or family member cares for them without pay	20.6
Took them to a childcare provider	24.3
Paid childcare provider in home	5.3
Other (specified in open-ended question)	7.3
Refused to answer	0.8

Source: Authors’ analysis of apprentice survey data.

Just over half of respondents were either married and living with their spouse or cohabitating with a partner during their current or most-recent apprenticeship. Within this group, about two-thirds had a working spouse or partner, most (68.7 percent) of whom were working full-time. Male apprentices were far more likely than female apprentices to rely on a spouse or partner to care for their children, nearly 46 percent of male respondents versus only 20 percent of female respondents. This situation reflects the traditional gender division of labor: men are still more likely than women to have a partner who provides the majority of childcare. Women were more likely to rely on unpaid friends or a family member other than a spouse or partner to look after their children. Relying on unpaid friends or extended family was the most common childcare arrangement for nearly one-third of women (32.5 percent) but only 18.4 percent of men. Among the group of respondents who used some “other” arrangement, an open-ended follow-up question revealed that most who chose this option used a combination of childcare arrangements or paid friends or family to look after their children either inside or outside of their homes. For parents, succeeding at a job requires that childcare is reliably available every single work day, which for which for apprentices may mean nights, weekends, and longer-than-usual hours Monday through Friday; the data show that apprentices who are mothers disproportionately depend upon unpaid, informal childcare arrangements, suggesting that they are more vulnerable to unexpected, job-disrupting childcare gaps than their male counterparts with children are.

Other Financial and Logistical Challenges

Dealing with the logistical requirements of getting to and from job sites, especially out-of-town sites, was a common concern. An overwhelming majority of survey respondents (81.1 percent) worked out of town during their current or most-recent apprenticeship. But there was a significant difference between women and men: about 85 percent of men worked out of town, compared to about 70 percent of women.²⁰

Transportation was challenging in terms of both access and cost. Paying for gas to get to and from work was reported as a “major problem” or a “minor problem” for 46.6 percent of apprentices surveyed. One in ten apprentices reported that

*“There was just too much travel time. They were sending me out of the area that I lived in. I could not afford to be away from home as a single dad. That was not working.”
(Latino male respondent, terminated)*

²⁰ Chi-square test significant at $p < .01$.

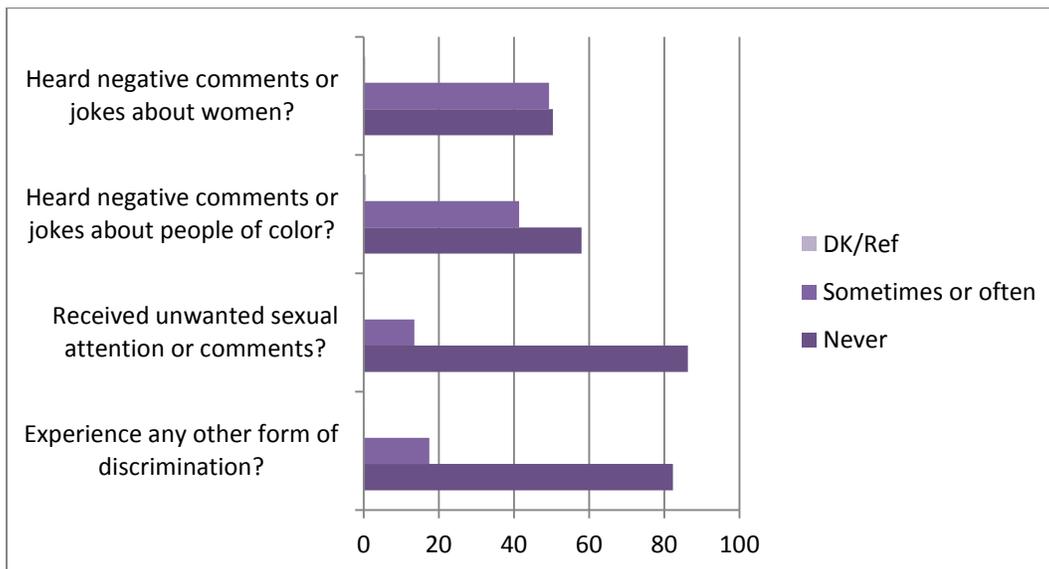
finding reliable transportation to and from work was a “major problem” or a “minor problem.”

Hostile Workplace Culture and Discrimination

After childcare and financial challenges, a workplace culture of hostility and disrespect emerged as a major theme in the survey. Hostile behaviors included discrimination and harassment on the basis of gender and race and ethnicity, but also on the basis of sexual orientation, age, and inexperience in the trades more generally. All in all, 38 percent of respondents reported experiencing discrimination or harassment of some kind during their current or most recent apprenticeship. Among female apprentices, this figure was 68 percent, compared to 28 percent among male apprentices.²¹

“I have been told that I’ll never be able to do the job that a man can. ‘If everyone could do it then women and children would be doing it,’ that’s the famous logo for ironworkers. It’s mostly the old timers though. The new guys don’t do it as much.”
(White female respondent, active)

Figure 6. Forms of Discrimination or Harassment Witnessed or Experienced by Apprentices



Source: Authors’ analysis of apprentice survey data. For the purposes of this figure, for “sometimes” or “often” were combined. These survey questions were asked of all survey respondents. DK/Ref stands for “don’t know/refused to answer.”

²¹ Chi-square test significant at $p < .001$.

Over half of female apprentices surveyed, nearly 55 percent in total, reported experiencing discrimination based on their gender either “sometimes” or “often”.

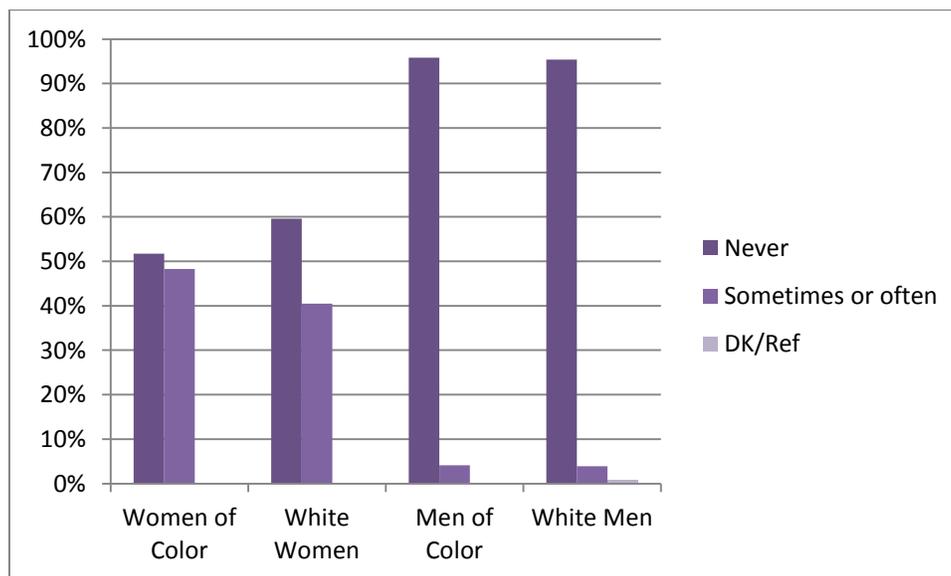
Women of color were significantly more affected than white women; over two-thirds (65.5 percent) of female

apprentices of color experienced gender-based discrimination “sometimes” or “often,” compared to 51.6 percent of white female apprentices.²² About four in ten women reported that they had

experienced unwanted sexual attention or comments on the job. Women of color were more likely than white women to report experiencing unwanted sexual attention or comments, with nearly half reporting that this had happened to them “sometimes” or “often”. The figure for white female apprentices was 40.5 percent. Only about 4 percent of male apprentices reported ever experiencing unwanted sexual attention or comments on the job.

“I was often told do stuff like sweep and clean up while other apprentices in my program were learning how to be carpenters. I was told to do menial stuff than learn how to be a carpenter.”
(Latina respondent, active)

Figure 7. Notable Variations in Experiencing Unwanted Sexual Attention or Comments on the Job



Source: Authors’ analysis of apprentice survey data. For the purposes of this figure, for “sometimes” or “often” were combined. These survey questions were asked of all survey respondents.

In addition to direct experiences, the survey revealed considerable evidence of generalized sexual comments in the workplace. Almost half (49.3 percent) of both men and women reported hearing

²² Chi-square test significant at $p < .01$.

negative comments or jokes about women on the job “sometimes” or “often”. Unsurprisingly, women were significantly more likely to be exposed to this than men. Over 70 percent of women reported hearing negative comments or jokes about women “sometimes” or “often” compared to about 42 percent among men.²³

Discrimination on the basis of race and ethnicity was also experienced by many apprentices.

“Being called a chief, casino, red-skin, or injun.”
(Native American male respondent, active)

Roughly three out of ten apprentices of color surveyed (30.3 percent) reported that they had experienced such treatment either “sometimes” or “often”. Among all apprentices, 41.4 percent reported hearing negative comments or jokes about people of color on the job “sometimes” or

“[On] jobs where minorities were required, people would say, ‘you’re only here because you are a minority.’ ” (African American male respondent, active)

“often.” Unlike in the case of hearing negative comments or jokes about women, there were no significant differences between the answers of women and men or those of white apprentices and apprentices of color on this question.

“We were just sitting at a lunch table and some dude said ‘oh wetbacks, go get insurance.’ Talking about wetback and beaners.” (Latino respondent, active)

Other forms of on-the-job discrimination were also reported by about 18 percent of respondents. In an open-ended follow-up question, apprentices described discrimination based on age, physical ability, sexual identity, and simply being inexperienced. Indeed, harassment that took the form of hazing as well as generalized belittling was directed at apprentices generally. Some of their responses included:

“I was discriminated for being an apprentice. People assumed I couldn’t perform a task.” (white, female, active)

“They think you’re stupid because you’re an apprentice and they think you don’t know anything. The journeymen think you don’t know anything.” (Native American, male, active)

“Apprentices always get a hard time on the job, lots of times guys try to make things extra difficult for us.” (white, male, completed)

Less commonly cited challenges

Although the categories below posed challenges for some apprentices, they were not among the commonly cited problems.

²³ Chi-square test significant at $p < .001$.

- Doing low-skill tasks on the job site was a “major problem” or a “minor problem” for 22.3 percent of apprentices surveyed,
- Not having anyone to mentor or teach the necessary skills of the trade was a “major problem” or “minor problem” for 37.4 percent of apprentices surveyed.
- Getting along with other apprentices, journey workers, foremen, or supervisors on the job sites was a “major problem” or “minor problem” for 22.2 percent of apprentices surveyed.
- Conditions of the job were a “major problem” or “minor problem” for 22.4 percent of apprentices surveyed.

In general, apprentices did not cite issues related to required classes as a major issue. However, these areas did pose a greater challenge to men of color than to women or whites. For example:

- Attending the required classes was a “major problem” or a “minor problem” for 22.9 percent of apprentices surveyed; however, women were significantly less likely to find attending the required classes a problem than men. This may be due in part to higher educational attainment among women apprentices. Over six in ten women in the survey sample (64.8 percent) had completed at least one year of college, compared to fewer than four in ten men (35.3 percent).
- Passing the required classes was a “major problem” or a “minor problem” for 10 percent of apprentices surveyed.

WORK EXPERIENCES FOLLOWING APPRENTICESHIPS AND REASONS FOR LEAVING

Among apprentices who left their apprenticeships before completing them, 8.6 percent were asked to leave, and 22.9 percent left for a specific reason, such as a lack of work, injury, illness, getting a different job in another field, or other changes in professional or life circumstances. Most apprentices (68.6 percent) who left before completion did so of their own accord in the sense that they were not formally asked to leave nor were they required to do so because of an injury or other significant life circumstance; however, it is not possible to say from the data if leaving was their preference, or if they felt in some way “run out” or “forced out” of their apprenticeship by, for instance, informal pressure, isolation, bullying or harassment, or not being given

“The main reason [I left] was because they weren’t giving me enough work to survive. I thought if the laborer program isn’t going to give me work then I had to go back to truck driving.”
(white female respondent)

“There’s a lot of different racial comments. In my two years in construction, I’ve worked with a lot of people who try to make you so uncomfortable they hope that you quit.”
(African American female respondent, active)

opportunities to learn or work. There were no significant differences by gender or race and ethnicity in reasons for leaving.

Leaving an apprenticeship took a toll on employment: among those who completed apprenticeships, about 8 percent were unemployed at the time of the survey; among those who left before completing, unemployment was about three times higher, 24.3 percent. Among survey respondents who had completed their apprenticeships, 88 percent were journey workers or working in construction in another capacity. In sharp contrast, the share of respondents who left before completing their apprenticeships who were working in construction at the time of the survey was just 22.9 percent.

Among apprentices who completed their apprenticeships, 82 percent were working as journey workers, 8 percent were unemployed, 6 percent were working in construction in another capacity, and 4 percent were working outside the field of construction. The percentage of men transitioning to journey work was higher than the percentage among women but this difference was not statistically significant. White men were slightly more likely than men of color to report being journey workers after completing their apprenticeships (roughly 87 percent to 83 percent, respectively).²⁴

RECOMMENDATIONS

Building a skilled and diverse workforce in the heavy highway trades requires concerted effort on many fronts. The survey, the successes of the Highway Construction Workforce Development Program thus far, and the experiences of other diversity efforts in Oregon and elsewhere suggest that the following areas should receive high priority.

Take action to improve workplace culture. Everyone has the right to be treated with fairness and respect on the job, regardless of gender, race and ethnicity, sexual identity, age, or level of experience. The heavy highway trades are falling badly short in this area, with workplace cultures and behavioral norms that are out of step with twenty-first century standards and expectations. An alarming number of respondents, over one in three, had experienced some form of discrimination or harassment on the job. More than twice the proportion of women as men (68 percent compared to 28 percent) reported having experienced some form of discrimination or harassment. About half of all respondents reported hearing negative comments or jokes about women, and four in ten reported hearing such comments about

²⁴ Chi-square test significant at $p < .05$.

people of color. Changing workplace culture takes time and multiple efforts, but a number of interventions could contribute to building more welcoming and tolerant jobsites.

One set of efforts should focus on the legislative and policy arenas. State-level leaders should publicly recognize the extent of the problem and put their support behind efforts to improve workplace culture. Convening relevant state-level policy makers as well as contractors and unions to review the evidence on workplace discrimination and harassment, including its nature, extent, and cost, and to create an action plan with meaningful, time-bound, concrete targets could be a good first step. Increased monitoring and investigation by relevant equal opportunity bodies at the state level is important, as is raising awareness among workers, unions, and contractors of existing equal opportunity laws, policies, and systems of redress. In cases where apprentices are the victims of discrimination or harassment on the job, especially when supervisors are not addressing the issue, formal mechanisms should be provided for apprentices to report abuse, seek redress, and be protected against retaliation. Existing “information and referral services” provided through Cooper Zietz and the Laborers could be supplemented with the creation of a formal ombudsman position and an investigative or review process with “teeth” to handle such requests. Finally, opportunities for social support for apprentices who have been victims of or who fear workplace discrimination, harassment, or retaliation are vital. Existing pre-apprenticeship and especially mentoring programs should be bolstered and expanded with this purpose in mind.²⁵

Another set of efforts should focus on conditions in worksites through direct engagement with contractors and the unions. Training for foremen and supervisors as well as journey workers and apprentices themselves should review existing laws, policies and systems of redress; address why workplace harassment and discrimination are harmful to apprentice career development, workplace efficiency, and morale; and equip individuals with practical, concrete guidance on what they should say and do if they are victims of or witness to these behaviors.²⁶ Existing training materials such as the Hard Hatted Women’s TOOLKIT curriculum or the Wisconsin Transition to Trainer Cultural Competency Curriculum are some existing resources to consult.

²⁵ Lutgen-Sandvik 2012.

²⁶ Ibid.

Improve access to affordable, reliable, high-quality childcare for Oregon’s low-income parents. Getting into the childcare business is not something that the Oregon Department of Transportation should do directly; however, joining with unions as well as with other state departments in sectors that depend on a workforce drawn heavily from low-income communities (such as the health sector, which relies tremendously on health aides and home health workers, or the tourism sector, which depends upon service workers) to make the case for affordable childcare would pay tremendous dividends. Low-income and even middle-income parents in Oregon, as in the country as a whole, have a dearth of quality childcare options they can afford, particularly for children under age 5; this situation limits the ability of parents, particularly mothers, to participate in the workforce at all, much less in a field like highway construction that requires long days and overnight travel, and exposes their children to the safety and developmental risks associated with poor-quality childcare. Bringing the highway trades into the twenty-first century depends upon changing attitudes, which is discussed below, but also on creating policies and offering services that respond to the realities of modern families.

Improve Awareness of BOLI-ODOT supportive services.

As the survey results illustrate, BOLI-ODOT support services are highly valued. Yet many who could use them are not aware of these services. Among those apprentices in eligible trades or who had worked on a highway or bridge project but not received services, only about a third (33.6 percent) were aware that these services

“If you want apprentices to know that there is money available to them through BOLI, you need to let the training center know. A lot of us don't open our mail, and a lot of us change our addresses. The training center is where you'll get the most saturation of apprentices.” (White male respondent, active)

existed. Among apprentices working in trades eligible to receive these services, more than seven in ten iron workers, equipment operators, and laborers in our survey were not aware of the BOLI-ODOT financial support services. Only carpenters and cement masons were slightly more likely than average to have known about the services.²⁷ However, among apprentices who were not aware that BOLI-ODOT supportive services existed, a strong majority (76.3 percent) would have applied for services had they had known about them. Within this group, apprentices of color would have been more likely than white apprentices to apply.²⁸ Publicizing services through direct mail to apprentices may not be the best way to reach busy, mobile apprentices. Rather, announcements during required classes and trainings and at

²⁷ These figures should be interpreted with caution given the very small numbers of respondents by trade who answered the survey question about knowledge of BOLI-ODOT support services.

²⁸ Men of color were significantly more likely to have responded affirmatively to this survey question than white men (chi-square test significant at $p < .01$). The difference between women of color and white women was not statistically significant.

jobsites with the cooperation of unions and contractors as well as direct calls and texts to apprentices themselves could be more effective. In addition, information about the supportive services and sign-up options should be made available to all new apprentices at the time of signing the apprenticeship agreement.

Expand recruiting activities to workers in their 20s and 30s. Efforts to recruit into heavy highway trade apprenticeships currently focus largely on teens and young adults between the ages of 16 and 24. High schools, community colleges, and job centers are the main venues of publicity for these programs. Employers in the highway industries want to focus their investments on developing the skills of young workers who will stick with their trades over their working lives, forming part of a highly-skilled workforce after they have completed their apprenticeships. However, analysis of the survey data shows that the typical new apprentice is around 30 and more likely than not to have one or more children. Furthermore, there are some important differences by gender and by race and ethnicity in the average age at which people begin apprenticeships. The average man is 29 and the average women 34 when starting an apprenticeship, and the range of average ages stretches from 28 for white men to 36 for women of color.

Outreach to youth is important and worth continuing; however, given that it seems especially effective at attracting young white workers, especially white men, already the most numerous demographic group in the heavy highway trades, there is considerable scope to revise youth outreach strategies and materials to better target young women and young people of color. In addition, outreach efforts should be rethought more broadly in light of the larger diversity goals of BOLI-ODOT. Women and people of color are currently more likely to start apprenticeships in their late 20's and early 30's. More should be done to inform these groups about careers in the heavy highway construction trades early on, but in the meantime increasing the diversity of new recruits into the apprenticeship pipeline could be achieved by putting greater focus on young adults in their later 20s and 30s. Possible venues to reach this demographic include community centers, places of worship, social service delivery agencies, and public health clinics, among others. This is an age when many are starting families, so materials on apprenticeship and employment opportunities should emphasize supportive services for childcare.

Strengthen and expand pre-apprenticeship and mentoring programs statewide. The survey revealed clearly that pre-apprenticeships are an effective conduit for women entrants into highway trade

apprenticeships. Fully half of the female apprentices surveyed had participated in such a program. However, the benefits seem to be limited to apprentices in the Portland area.²⁹ Nearly 87 percent of apprentices who completed a BOLI-recognized pre-apprenticeship program were based in Portland, as were 82 percent of mentoring participants. Expanding support for pre-apprenticeship and mentoring programs to other regions of the state could be one avenue to increase the recruitment of women. Research suggests that effective mentoring is one of the best methods for supporting female apprentices. Trainings for apprentices preparing to journey out on how to be effective mentors may also improve the quality of these interactions.³⁰

Set up a resource center to help connect apprentices with other opportunities during out-of-work periods. Being out of work too much was something that a majority of survey respondents (56.6 percent) reported was a problem for them in their current or most recent apprenticeship. With the exception of mentoring, BOLI-ODOT supportive services are available only while apprentices are working or in classes. BOLI-ODOT could support the creation of a resource center to connect apprentices with mentoring and case management services and to coordinate with other state agencies, business, and community groups to place apprentices in temporary jobs or volunteer positions during the slow winter months or at other points in the year when apprentices are out of work for considerable periods of time.

Ensure all apprentices have equal opportunities for on the job training. A significant problem for apprentices was being out of work too much (over half of apprentices surveyed reported this was a “major problem” or “minor problem”). Further, not being consistently employed was one of the main reasons apprentices provided for leaving their apprenticeship program before completing. However, the results of this and other investigations suggest that a lack of opportunities for work was particularly problematic for women and people of color and is contributing to their overall lower rates of completion. In assessing apprenticeship programs, researchers have determined that racial/ethnic and gender inequities are pervasive throughout organizational policies, practices, and ideologies.³¹ For example, the policy of the “out of work list” is, on the surface, gender and race/ethnicity neutral; however, it disadvantages women and people of color who are less consistently employed than white men. The practice of apprentices soliciting their own jobs is also, on the surface, gender and

²⁹ OAS data on apprentice address includes the most recent known address of apprentices in the system. Pre-apprenticeship and mentoring programs apprentices have participated in may not necessarily have been in the city where they currently reside.

³⁰ Reed et al, 2012.

³¹ Kelly and Wilkinson, 2012; Kelly et al, in process.

race/ethnicity neutral but contributes to white men's advantage in remaining steadily employed as they are more easily able to draw on informal networks. Apprenticeship programs must ensure that all apprentices have equal opportunities to access jobs and minimize the degree to which employment is contingent upon personal relationship and networks.

Further, once on the job, apprentices across the board experience challenges with obtaining appropriate training opportunities. For example, not having anyone to mentor or teach the necessary skills of the trade was a "major problem" or "minor problem" for 37.4 percent of apprentices surveyed. Some apprentices reported doing only low-skill and repetitive tasks (such as flagging or cleaning) and not having the opportunity to learn the skills needed for their trade. While apprentices should expect to some amount of low skill tasks, particularly at the start of their apprenticeship, they should also expect to get the opportunity to learn the skills needed to become successful journey workers. Apprenticeship programs must ensure that all apprentices are being appropriately mentored by journey workers and other senior workers on the job site by adopting policies for the oversight of journey workers responsible for teaching apprentices, considering rotations (where appropriate) to ensure apprentices have the opportunity to learn varied skills, and a system for apprentices to report when they are not receiving appropriate training and mentoring on the job site.

Explore ways to ensure that the limited funds available through the Highway Construction Workforce Development Program are used most effectively. The purpose of the program's financial supports is to ensure that apprentices who would not be able to participate in and complete their apprenticeships are able to do so. Channeling funds to those who would complete the program without such support is not a strategic use of limited resources. Developing ways to allocate financial assistance based on a calculation of the "living wage" for the state to ensure that those who most need the monetary supports receive them might be a good approach. Doing so may require authority to limit eligibility based on income levels and family composition and to collect financial and family information to determine eligibility. In developing such an allocation system, it would be important to ensure that the methodology is transparent, straightforward, and not onerous and that the actual costs associated with implementing the system (verifying income, gathering and verifying family composition data, etc.) do not outweigh its benefits. Efforts should be made to track the effects of such a change in the program eligibility determination.

Improve data collection on current and past apprentices. Implementing the Performance Measurement System detailed below and improving future research on Oregon’s heavy highway construction workforce could be greatly facilitated with a few small changes. For example, changing the way that race and ethnicity are collected on Oregon’s Apprenticeship Registration Agreement to make this consistent with current federal standards as used by the U.S. Census Bureau could greatly enhance the comparability of data on race and ethnicity in the OAS to data collected through other sources. Future iterations of the apprentice survey could be improved by expanding the sample size to enable better analysis of differences in the challenges and experiences of apprentices in the state by gender, race and ethnicity, trade, parenthood, and other relevant factors. Additionally, a question asking apprentices if they have been unemployed for three months or more in the past year should be added to shed light on the critical issue of the difficulty many apprentices face with extended periods of layoff.

PERFORMANCE MEASUREMENT SYSTEM

Survey results presented in this report present a snapshot in time of the experiences and perceptions of individuals who are or were apprentices in recent years and analysis of BOLI-ODOT administrative data on apprentices active between 2005 and 2013. Tracking progress towards BOLI and ODOT’s workforce development goals will require regular monitoring of a set of indicators representing inputs, outcomes, and some intermediary factors that have a bearing on apprentice success. Moving forward, the following indicators should be part of the performance monitoring system:

No	Indicator	Source	TOTAL	White Men	White Women	Men of Color	Women of Color
1	Number completing pre-apprenticeship programs	Pre-apprenticeship program administrators	N/A	N/A	N/A	N/A	N/A
2	Percentage completing pre-apprenticeship programs who enroll in an apprenticeship	Pre-apprenticeship program administrators	N/A	N/A	N/A	N/A	N/A
3	Percentage distribution of newest cohort of apprentices in the heavy highway trades (%) [2013 data]	OAS data	100	73.1	6	19.3	1.5
4	Percentage of active apprentices working in eligible trades who receive BOLI financial supportive services	OAS data	16.6	14.9	18.2	17.5	41.4
5	Percentage of survey respondents participating in mentoring	Apprentice survey data	15.0	15.1	27.3	9.2	20.7
6	Percentage of survey respondents in eligible trades aware that BOLI supportive services exist	Apprentice survey data	33.6	27.7	40.9	33.9	28.6
7	Percentage of survey respondents who report experiencing some form of discrimination or harassment on the job	Apprentice survey data	38	17.1	68.7	35.1	65.5
8	2013 completion rates among those not active, moved, or deceased	OAS data	60.3	63.6	52.0	46.6	54.5
9	Percentage of survey respondents who completed their apprenticeship who are now journey workers	Apprentice survey data	82	86.5	66.7	82.6	80
10	Percentage of apprentices reporting that they have been out of work for more than three months in the past year	N/A	N/A	N/A	N/A	N/A	N/A

Source: Authors’ analysis of OAS and apprentice survey data. See the methodological note for details on each indicator. Data from pre-apprenticeship program administrators were not available at the time of writing.

Methods Note

This methodological note provides additional details on the three primary sources of data analyzed for this report.

Oregon Apprenticeship System (OAS) Data

OAS data analyzed for this report covered the 2005 to 2013 cohorts (including 97 apprenticeship agreements initiated in the first month of 2014) of apprentices in highway construction trades who were active between March 1st 2011 and January 31st 2014 and who did not cancel with zero credit hours accumulated. This included data on 6,445 current and past apprentices, including 4,958 white men (76.9 percent), 1,036 men of color (16.1 percent), 358 white women (5.6 percent), and 92 women of color (1.4 percent). OAS data are compiled from records of the Laborers and Cooper Zeitz Engineering, Inc. as well as from Apprenticeship Registration Agreement forms. The OAS record for the gender of one apprentice was corrected in light of a discrepancy discovered in the course of the telephone survey. All estimates from OAS data exclude apprenticeship agreements cancelled with 0.0 credit hours and apprentices who have had more than one apprenticeship agreement. In these cases, only the most-recent apprenticeship agreement data was used for the apprentice in question. Finally, eligibility for BOLI-ODOT supportive financial services was approximated by analyzing the OAS variable for trade. Apprentices whose trade was carpenter, pile driver, cement mason, plasterer, ironworker, laborer, or operating engineer were considered to be working in eligible trades. Painters active during or after July 2013 were also considered to be working in an eligible trade.

Telephone Survey

Our survey was conducted by the Portland State University Survey Research Lab between March 19th and March 31st, 2014. The final sample included 519 current and former apprentices in the heavy highway construction trades and achieved a response rate of 47.2 percent.³² The average interview took 12.2 minutes to complete. The sample was stratified by receipt of BOLI-ODOT supportive services, gender, race/ethnicity, and trade, with an oversample of women and people of color. The survey included respondents who did (21.2 percent) and did not avail themselves of BOLI-ODOT services, so that challenges facing non-service recipients could be analyzed with the survey data as well. Women and people of color were oversampled to ensure that there would be a sufficient number of responses from individuals in these groups to permit some analysis of the results by gender and by race and ethnicity. As a result, 239 (46.1 percent of survey respondents) were men of color, 152 (29.3 percent) were white men, 99 (19.1 percent) were white women, and 29 (5.6 percent) were women of color. Eight survey respondents refused the question on race and ethnicity and one respondent did not know their race/ethnicity. In order to keep these survey responses in the analysis, we imputed the race and ethnicity these apprentices reported on their Apprentice Agreement Forms. The largest groups by trade within the sample were electricians (29.3 percent), carpenters (27 percent), and laborers (12.9 percent), with smaller percentages of sheet metal workers, ironworkers, plumbers, and other trades. Eligibility for

³² A response rate of 47.2 percent reflects the number of completed interviews as a percentage of all resolved numbers. The response rate of completed interviews as a percentage of all eligible numbers was 28.4 percent.

BOLI-ODOT supportive financial services was approximated by analyzing survey responses on trade and participation in a bridge or highway project during the respondent's current or most recent apprenticeship. Apprentices were considered eligible if they reported working on a bridge or highway project or if their trade was carpenter, cement mason, ironworker, laborer, or operating engineer. Painters active during or after July 2013 were also considered to be working in an eligible trade.

Small numbers of respondents either refused or indicated that they did not know the answers to some questions in the telephone survey. Estimates made from these data include refused/don't know answers as a valid response category. Where applicable, tables and figures in this report show these responses labeled with the abbreviation "DK/Ref."

Note on Race and Ethnicity

In the OAS data, race and ethnicity data are collected through the Apprenticeship Registration Agreement form on which apprentices are prompted to report their race and ethnicity by checking one box under the abbreviations "WH", "BL", "AI", "AS", or "HI". In the apprentice telephone survey, apprentices were asked to describe their race or ethnicity in a manner consistent with the 1997 White House Office of Management and Budget guidelines on federal statistical reporting of race and ethnicity.³³ Survey respondents could identify their race as white, Black or African American, Native American or Alaska Native, Asian American, Native Hawaiian or Other Pacific Islander, or any combination of these. Respondents were asked to identify their ethnicity as either Hispanic or Latino, or not Hispanic or Latino. Because of the different ways in which data on race and ethnicity were compiled in the OAS and telephone survey, the race and ethnicity of individual apprentices were not always recorded the same way across the two data sources. Tabulations from OAS data use race and ethnicity data as they appear in the OAS and tabulations from survey responses use race and ethnicity data as they appear in that source. Throughout this report, we have used "people of color" to refer to anyone who self-identifies with a race and ethnicity combination other than non-Hispanic white alone.

Note on the Performance Measurement System

The following notes provide additional details on the definitions of the indicators included in the Performance Measurement System:

1. Data are not currently available but should be collected from pre-apprenticeship programs in the future.
2. Data are not currently available but should be collected from pre-apprenticeship programs in the future.

³³ For more information see http://www.whitehouse.gov/omb/fedreg_1997standards

3. Race/ethnicity and gender of apprentices (in highway construction trades) as reported on the apprenticeship agreement form for apprentices who began apprenticeship agreements in 2013 and did not cancel with 0 credit hours.
4. The percentage of apprentices (in highway construction trades) active as of January 31st, 2014 who had received one or more financial support service from BOLI-ODOT.
5. The percentage of all survey respondents who reported participating in mentoring.
6. The percentage of survey respondents who indicated that they had worked on a bridge or highway project and/or who worked as carpenters, cement masons, ironworkers, laborers, operating engineers, or painters (if active after July 2013) who were aware that BOLI-ODOT supportive services existed. Survey question about awareness of BOLI-ODOT supportive services was only asked of apprentices who indicated that they had not received them.
7. The percentage of all survey respondents who indicated that they experienced any form of discrimination or unwanted sexual attention or comments on the job either “sometimes” or “often.”
8. The number of apprentices (in highway construction trades) successfully completing an apprenticeship in 2013 as a percentage of apprentices completing or terminating an apprenticeship agreement in 2013 (i.e. excluding those who were active, moved, or deceased).
9. The percentage of survey respondents who had completed or terminated their apprenticeship agreement (in a highway construction trade) who were working as journey workers at the time of the survey.
10. Not available from current apprentice survey data but an item on extended periods out of work should be included in future iterations of the survey.

Statistical Appendices

Appendix A. Enrollment, Status, and Completion Apprenticeships by Gender and Race (OAS Data)

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Percentage distribution of all apprentices in the OAS	100	93	7	76.9	16.1	5.6	1.4
Percentage distribution of apprentices in the 2005 cohort	100	94.3	5.7	83.5	10.8	4.4	1.3
Percentage distribution of apprentices in the 2006 cohort	100	95.1	4.9	85.5	9.7	4.1	0.7
Percentage distribution of apprentices in the 2007 cohort	100	94.4	5.6	81.7	12.7	4.7	0.9
Percentage distribution of apprentices in the 2008 cohort	100	95	5	80.7	14.4	3.8	1.2
Percentage distribution of apprentices in the 2009 cohort	100	91.1	8.9	73.9	17.2	4.5	4.5
Percentage distribution of apprentices in the 2010 cohort	100	93.8	6.3	73.8	20	5.2	1
Percentage distribution of apprentices in the 2011 cohort	100	92.4	7.6	76.9	15.5	6.1	1.5
Percentage distribution of apprentices in the 2012 cohort	100	91.4	8.6	74.6	16.7	7.2	1.4
Percentage distribution of apprentices in the 2013 cohort†	100	92.5	7.5	73.1	19.3	6	1.5
Completion rate, January 2011 – January 2014 (%)	64.7	65.6	51.8***	68.1	51.9***	54.7	41.9
Completion rate, 2011 (%)	71.1	72.3	46.7***	74.9	57.6***	51.4	30
Completion rate, 2012 (%)	65.5	66.4	53.8*	68.4	55.2**	58.1	38.9
Completion rate, 2013 (%) ††	60.3	60.9	52.5	63.6	46.6***	52	54.5

Note: Differences between groups were tested for statistical significance using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05, **p<.01, ***p<.001.

† Indicator 3 in the Performance Management System

†† Indicator 8 in the Performance Management System

Appendix B. Apprentice Trade, Demographics, Status, and Use of BOLI-ODOT Services by Gender and Race (OAS Data)

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Trade is bricklayer (%)	0.6	0.7	0***	0.7	0.6***	0	0
Trade is carpenter (%)	12.3	11.9	17.8***	10.7	17.7***	16.2	23.9***
Trade is cement mason (%)	1.6	1.6	2.7***	1.2	3.3***	1.7	6.5***
Trade is electrician (%)	39.5	40.1	32.7***	43.3	24.5***	38.3	10.9***
Trade is ironworker (%)	5.5	5.6	3.3***	5.0	8.7***	3.6	2.2***
Trade is laborer (%)	6.8	6.5	11.1***	5.1	13.2***	9.8	16.3***
Trade is operating engineer or equipment operator (%)	2.3	2.1	5.1***	2	2.5***	5	5.4***
Trade is painter (%)	2.5	2.3	6.0***	2	3.8***	4.7	10.9***
Trade is plumber (%)	12.3	12.3	3.3***	13.3	7.4***	3.6	2.2***
Trade is sheet metal worker (%)	6.7	6.8	6.2***	7.1	5***	6.4	5.4***
Other trade (%)	10.4	10.3	11.8***	9.6	13.3***	10.6	16.3***
Percentage distribution of all apprentices in the OAS	100	93	7	76.9	16.1	5.6	1.4
Average age at Indenture (years)	28.3	28.1	31.8***	27.7	29.7***	31.6	32.4
Completed High School or a GED (%)	86.2	86	89.6	86.5	83.5*	91.3	82.6*
Completed Some College (%)	38.5	37	58.4***	37.2	36.3	60.1	52.2
Completed Some Vocational School (%)	15.4	14.9	21.8***	15.1	14.2	20.1	28.3
Apprenticeship status is active (%)	52.4	52.2	56***	51.1	57.2***	57	52.2
Apprenticeship status is completed (%)	30.5	31.1	22.2***	33.1	21.9***	22.9	19.6
Apprenticeship status is terminated (%)	16.6	16.3	20.7***	15.5	20.3***	19	27.2
Apprenticeship status is moved (%)	0.4	0.4	1.1***	0.3	0.6***	1.1	1.1
Received one or more BOLI-ODOT sponsored services (% in eligible trades)	14.5	13.3	24.5***	12.5	15.3	20.8	34.5*
Service recipients with per diem support (%)	37.3	37.8	35	37.6	38.2	33.3	38.1
Service recipients with fuel support (%)	52.7	55.4	40*	57.1	51.7	35.9	47.6
Service recipients with child care support (%)	11.8	10.4	18.3	9	13.5	10.3	33.3*
Service recipients with support for tools/PPE (%)	69.2	68.7	71.7	68.8	68.5	69.2	76.2
Recipients of social supports (%)	1.7	1.2	8.2***	0.8	2.8***	7.8	9.8

Note: Differences between groups were tested for statistical significance using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05, **p<.01, ***p<.001.

Appendix C. Apprentice Trade, Demographics, Status, and Use of BOLI-ODOT Services by Gender and Race (Survey Data)

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Trade is bricklayer (%)	1	1	0.8	0.7	1.3	0	3.4
Trade is carpenter (%)	27	26.6	28.1	21.7	29.7	27.3	31
Trade is cement mason (%)	2.7	3.1	1.6	1.3	4.2	1	3.4
Trade is electrician (%)	29.3	26.9	36.7	24.3	28.5	38.4	31
Trade is ironworker (%)	6.2	7.2	3.1	7.9	6.7	3	3.4
Trade is laborer (%)	12.9	14.1	9.4	19.7	10.5	10.1	6.9
Trade is operating engineer or equipment operator (%)	5.8	5.9	5.5	7.2	5.0	7.1	0
Trade is painter (%)	1.9	1.8	2.3	3.3	0.8	1	6.9
Trade is plumber (%)	6.2	7.7	1.6	7.9	7.5	2	0
Trade is sheet metal worker (%)	6.4	5.4	9.4	5.3	5.4	9.1	10.3
Other trade (%)	0.8	0.5	1.6	0.7	0.4	1	3.4
Percentage distribution of all respondents in survey sample	100	75.3	24.7	29.3	46.1	19.1	5.6
Average age at Indenture (years)	30	28.8	33.8***	27.9	29.4*	33.1	36
Completed High School or a GED (%)	87.5	85.7	93	83.6	87	94.9	86.2
Completed Some College (%)	42.6	35.3	64.8***	28.9	39.3	66.7	58.6
Completed Some Trade School (%)	16	15.9	16.4	11.2	18.8*	15.2	20.7
Married or living with a cohabitating partner (%)	53	55.7	44.5***	57.8	54.4	47.5	34.2
Responsible for one or more children under 18 (%)	51.4	55.2	39.8**	50	58.6	36.4	51.7
Responsible for one or more children under 5 (% of respondents with one or more children under 18)	58.8	64.4	35.3***	63.2	65	36.1	33.3
Children lived with apprentice full-time during apprenticeship (% of respondents with one or more children under 18)	89.6	90.5	85.7**	96	87.6	80	100
Completed BOLI-recognized a pre-apprenticeship program (%)	20.4	10.7	50***	8.6	12.1	48.5	55.2
Apprenticeship status is active (%)	67.2	66.2	70.3	61.8	69	69.7	72.4
Apprenticeship status is completed (%)	19.3	21.2	13.3	24.3	19.2	12.1	17.2
Apprenticeship status is terminated (%)	13.5	12.5	16.4	13.8	11.7	18.2	10.3

Note: Differences between groups were tested for statistical significance using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05, **p<.01, ***p<.001.

Appendix D. Apprenticeship Work Experience and Evaluation of Supportive Services by Gender and Race (Survey Data)

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Spouse or partner works full-time (% living with spouse or partner)	68.7	64.7	84.2**	68.2	62.3	87.2	70
Spouse or partner cared for children during work (% with own children under 18 requiring care)	41.7	45.9	20*	50.7	43.3	22.2	15.4
Unpaid friend or family member care for children during work (% with own children under 18 requiring care)	20.6	18.4	32.5*	16.4	19.4	33.3	30.8
Paid child care provider outside of home cared for children during work (% with own children under 18 requiring care)	24.3	24.2	25*	21.9	25.4	22.2	30.8
Paid child care provider at home cared for children during work (% with own children under 18 requiring care)	5.3	4.8	7.5*	5.5	4.5	3.7	15.4
Other child care arrangement (% with own children under 18 requiring care)	7.3	5.8	15*	5.5	6	18.5	7.7
Worked on a highway or bridge project during most recent apprenticeship (%)	30.3	29.2	33.6	30.3	28.5	32.3	37.9
Worked out of town during most recent apprenticeship (%)	81.1	84.7	70.3**	85.5	84.1	68.7	75.9
Participated in mentoring (%)	15	11.5	25.8**	15.1	9.2	27.3	20.7
Mentoring participants evaluating mentoring as somewhat or very helpful (%)	97.5	100	93.9	100	100	92.6	100
Service recipients evaluating per diem support as somewhat or very helpful (%)	97.8	97.6	100	95.2	100	100	100
Service recipients evaluating fuel support as somewhat or very helpful (%)	100	100	100	100	100	100	100
Service recipients evaluating child care support as somewhat or very helpful (%)	100	100	100	100	100	100	100
Service recipients evaluating support for tools/PPE as somewhat or very helpful (%)	100	100	100	100	100	100	100
Service recipients agreeing that BOLI-ODOT supports allowed them to take jobs they would otherwise not have been able to take (%)	72.5	71.3	80*	66.7	76.7	70	100
Active service recipients reporting that they would not be able to complete their apprenticeships without supports (%)	37.5	33.9	60	50	75	33.3	34.5
Service recipients who completed apprenticeships reporting that they would not have been able to	21.7	18.2	100	16.7	20	100	0

complete their apprenticeships without supports (%)							
Non-service recipients aware that BOLI-ODOT services exist (% in eligible trades)	33.6	32.1	37.9	27.7	33.9	40.9	28.6
Non-service recipients who would have applied for BOLI-ODOT services if they had been aware of them (%)	76.3	78.7	69.8	68.3	84.5**	66.7	80

Note: Differences between groups were tested for statistical significance using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05, **p<.01, ***p<.001.

Appendix E. Challenges Facing Apprentices by Gender and Race (Survey Data)

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Cost of childcare is a major/minor problem (% who paid for child care)	76.7	73.3	92.3	75	72.5	85.7	100
Finding consistent child care is a major/minor problem (% with own children under 18)	34.4	33.8	37.3	25	38.6**	33.3	46.6
Being out of work too much is a major/minor problem (%)	56.6	58.6	50.8	66.4	53.6	48.5	58.6
Performing low-skill tasks is a major/minor problem (%)	22.3	19.9	29.7	20.3	19.7	31.4	24.1
Lack of mentoring is a major/minor problem (%)	37.4	36.1	41.4	30.2	39.7	38.4	51.7
Getting along with others on the jobsite is a major/minor problem (%)	22.2	20.7	26.6	23.7	18.9	26.2	27.5
Conditions of the job are a major/minor problem (%)	22.4	22.2	22.6	19.7	23.9	25.2	13.8
Finding reliable transportation is a major/minor problem (%)	10.4	10.7	9.4*	11.2	10.5	11.2	3.4
Attending required classes is a major/minor problem (%)	22.9	26	13.3*	30.3	23.5	15.2	6.9
Passing required classes is a major/minor problem (%)	10	10.5	8.6	6	13.4	5.1	20.6*
Paying for gas is a major/minor problem (%)	46.6	49.1	39.1	45.4	51.4	42.5	27.5
Paying for food and lodging out of town is a major/minor problem (% who worked out of town)	32.9	35.2	24.4	33	36.7	25	22.7
Buying tools and equipment is a major/minor problem (%)	51.2	49.9	55.5	40.8	55.7*	57.5	48.2
Heard negative comments or jokes about people of color on the job sometimes/often (%)	41.4	40.4	44.6	36.9	42.7	42.4	51.7
Experienced discrimination based on race or ethnicity on the job sometimes/often (% respondents of color)	30.3	29.8	34.5	-	29.8	-	34.5
Heard negative comments or jokes about women on the job sometimes /often (%)	49.3	42.1	71.1***	36.2	46**	71.7	68.9
Experiences unwanted sexual attention or sexual comments on the job sometimes/often (%)	13.5	4.1	42.2***	3.9	4.1	40.5	48.3*
Experienced discrimination based on gender on the job sometimes/often (% of women respondents)	54.7	-	54.7	-	-	51.6	65.5**
Experienced any other form (not based on gender or race/ethnicity) of discrimination the job sometimes/often (%)	17.5	16.1	21.9	14.5	17.1	21.2	24.1
Experienced one or more forms of discrimination or harassment on	38	28.1	68***	17.1	35.1***	68.7	65.5

the job sometimes/often (%)							
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Note: Differences between groups were tested for statistical significance using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix F. Apprenticeship Status and Experiences After Apprenticeship by Gender and race (survey data)

	TOTAL	Men	Women	White Men	Men of Color	White Women	Women of Color
Respondents enrolled at time of interview (%)	67.2	66.2	70.3	61.8	69	69.7	72.4
Respondents who completed an apprenticeship (%)	19.3	21.2	13.3	24.3	19.2	12.1	17.2
Respondents who left before completing (%)	13.5	12.5	16.4	13.8	11.7	18.2	10.3
Left on own accord (% respondents who left before completing)	68.6	69.4	66.7	71.4	67.9	61.1	100
Asked to leave (% respondents who left before completing)	8.6	8.2	9.5	4.8	10.7	11.1	0
Left for some other reason (% respondents who left before completing)	22.9	22.4	23.8	23.8	21.4	27.8	0
Working as journey worker at time of interview (% of respondents who completed apprenticeships)	82	84.3	70.6	86.5	82.6*	66.7	80
Working as journey worker at time of interview (% respondents who left before completing)	4.3	4.1	4.8	4.8	3.6	5.6	0
Unemployed at time of interview (% of respondents who completed apprenticeships)	8	7.2	11.8	13.5	2.2*	8.3	20
Unemployed at time of interview (% respondents who left before completing)	24.3	24.5	23.8	28.6	21.4	27.8	0
Working in construction in another capacity at time of interview (% of respondents who completed apprenticeships)	6	6	5.9	0	10.9*	8.3	0
Working in construction in another capacity at time of interview (% respondents who left before completing)	18.6	24.5	4.8	19	28.6	5.6	0
Working in a job not in construction at time of interview (% of respondents who completed apprenticeships)	4	2.4	11.8	0	4.3*	16.7	0
Working in a job not in construction at time of interview (% respondents who left before completing)	52.9	46.9	66.7	47.6	46.4	61.1	100

Note: Differences between groups were tested for statistical significance using chi-square tests for categorical variables and t-tests for continuous variables. Significant differences are flagged as follows: *p<.05, **p<.01, ***p<.001.

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