

2022 Evaluation of the Highway Construction Workforce Development Program

Maura Kelly
Portland State University
November 2022





Portland State UNIVERSITY

REPORT AUTHORS

Maura Kelly holds the position of Professor of Sociology at Portland State University. She has a PhD in Sociology from the University of Connecticut. Dr. Kelly's construction trades research focuses on race/ethnicity, gender, sexualities, and work and occupations. You can find more information at maura-kelly.com.

The author offers thanks to the research assistants who aided with the data collection and analysis for this project: Ned Tilbrook, Anne Johnson, and Cameron Arnold.

PROJECT FUNDERS

This project was funded through the Highway Construction Workforce Development Program by the Oregon Bureau of Labor and Industries and the Oregon Department of Transportation.



Table of Contents

<i>Executive summary</i>	5
<i>Introduction</i>	8
<i>Findings from the 2022 Needs Assessment for Oregon’s Highway Trades Apprenticeships</i>	9
Trends in recruitment	9
Trends in completion	9
Apprentices’ reasons for leaving apprenticeship	10
Apprentices’ problems during apprenticeship	10
Apprentices and childcare	10
<i>Impact of Program services</i>	11
Participation in the Highway Construction Workforce Development Program	11
Impact of financial and non-financial support on completion	11
<i>Apprentices’ perspectives on the Program</i>	13
How apprentices benefitted from support from the Program	13
How Program services can be improved	15
Financial and non-financial support from other sources.....	16
<i>Impact of pre-apprenticeship</i>	16
Participation in pre-apprenticeship	17
Impact of pre-apprenticeship on completion	18
<i>Respectful workplaces</i>	18
Participation in respectful workplace programs	18
Intervening in response to harassment on the job	19
Supervisors’ responses to jobsite harassment	19
<i>Recommendations</i>	20
Non- financial support	20
Hardship funds	21
Childcare	21
Ready items.....	22
Travel support	23
Pre-apprenticeship.....	23
Respectful workplaces	23
Structural changes	24

References 25

APPENDIX A. Research design..... 26

 Administrative data 26

 2022 Survey of Oregon Apprentices 26

 Demographics 27

APPENDIX B. Highway Workforce Development Program contracts 30

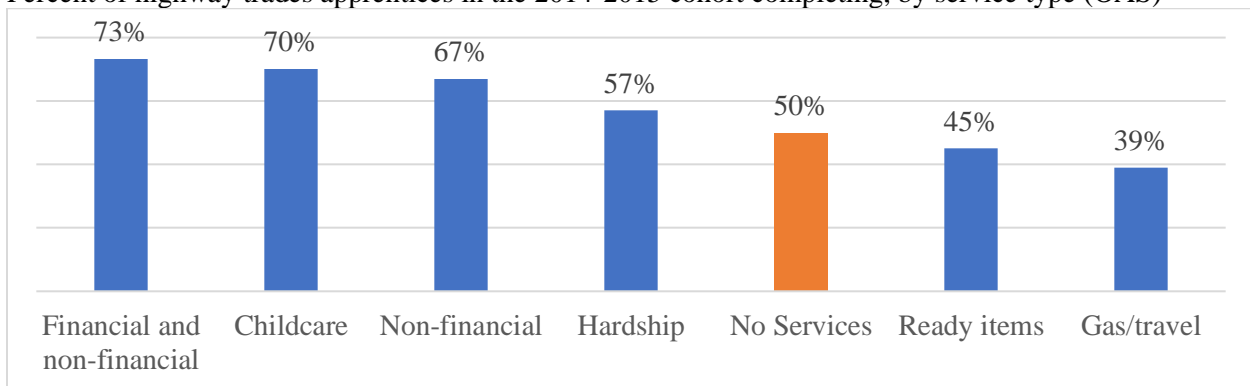
APPENDIX C. Fact sheets for industry partners 31

Executive summary

The Oregon Department of Transportation (ODOT) and Oregon Bureau of Labor and Industries (BOLI) have partnered in a statewide effort—the Highway Construction Workforce Development Program—to recruit, train, and employ a diverse workforce for highway construction jobs throughout the state. This program, begun in 2010, supports a variety of initiatives designed to improve the recruitment and retention of women and people of color in Oregon’s highway construction trades. In the 2020-2021 biennium, ODOT invested a total of about \$2 million in the Program. The programs evaluated in this report include the following: pre-apprenticeship programs, supportive services providing financial assistance (i.e., fuel assistance; support for overnight travel; childcare; work clothes, tools, and protective equipment; hardship funds) and supportive services providing non-financial assistance (i.e., budget class, social support). This report provides findings based on data from BOLI’s Oregon Apprenticeship System (OAS) and the 2022 Survey of Oregon Apprentices. Overall, the current evaluation demonstrates the effectiveness of the Highway Construction Workforce Development Program at improving both the recruitment and retention of a diverse workforce over the past decade as well as effectiveness of the program since the last reporting period.

Receiving both financial *and* non-financial services had the largest positive impact on completion, followed by child care subsidies, non-financial services, and hardship funds; ready items and gas/travel did not have a positive impact on completion.

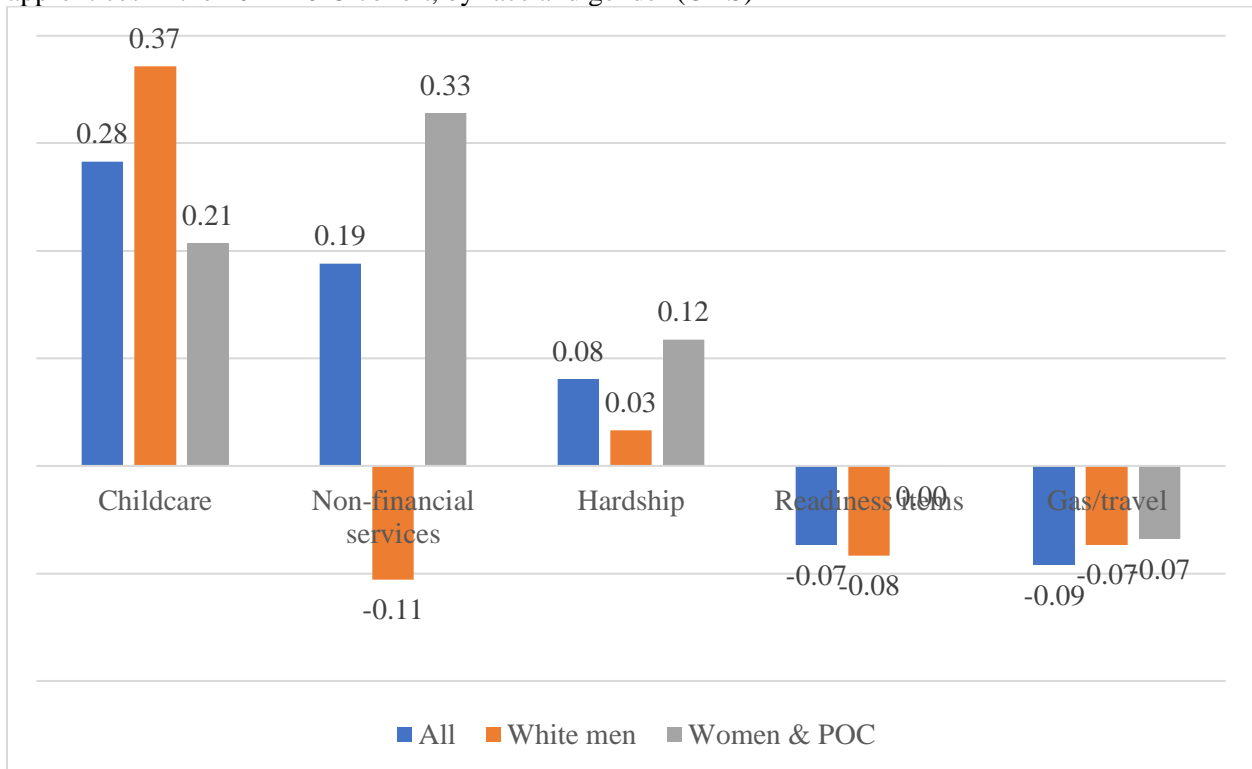
Percent of highway trades apprentices in the 2014-2015 cohort completing, by service type (OAS)



Childcare has a larger positive impact on completion rates of white men compared to women and people of color.¹ Non-financial services and hardship funds had larger positive impacts on completion rates for women and people of color compared to white men.

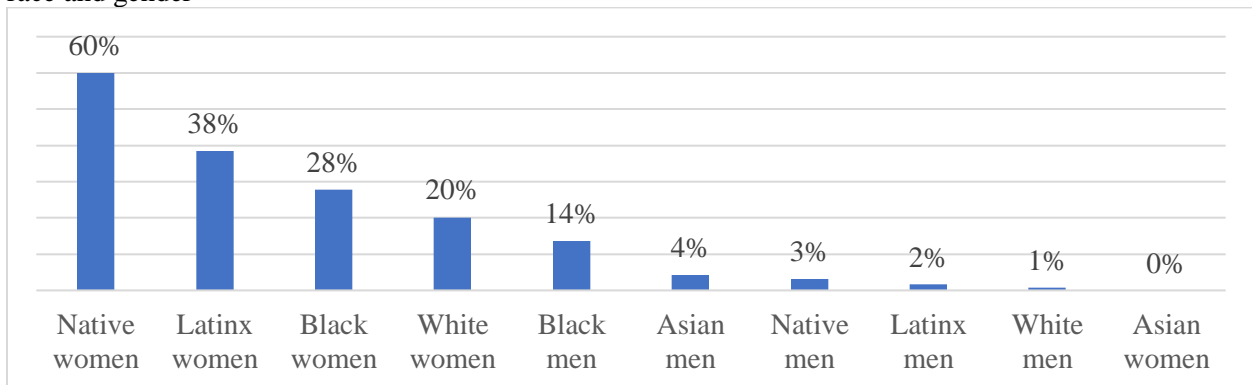
¹ White men service recipients are 37% more likely than white men without services to complete apprenticeship; women and people of color who receive childcare subsidies are 21% more likely to complete.

Marginal effects of each service type, net of other service types, on completion rates of highway trades apprentices in the 2014-2015 cohort, by race and gender (OAS)



Pre-apprenticeship programs have contributed to diversifying the highway construction workforce. For the 2014-2015 cohort, 27% of all women and 14% of Black men entered via pre-apprenticeship. Completing a pre-apprenticeship has a positive effect on completion of an apprenticeship among women only in the 2014-2015 cohort.

Percent of highway trades apprentices in the 2014-2015 cohort who completed a pre-apprenticeship, by race and gender



Apprentices report engaging with emerging respectful workplace models. In the 2022 Survey of Oregon Apprentices, 18% of apprentices had participated in any respectful workplace programs. These included the Pacific Northwest Carpenters Institute (PNCI) positive jobsite culture (7%), Green Dot for the Trades (4%), RISE Up (3%), and others (6%). Apprentices who reported participating in PNCI's Positive Jobsite Culture training were more likely to intervene in response to jobsite harassment than those who had not participated (participants in other programs were not more likely to intervene).

Recommendations

- Overall, pre-apprenticeship and supportive services funded by the Highway Construction Workforce Development Program are increasing the recruitment and retention of a diverse workforce and these efforts should be continued.
- As the combination of financial and non-financial services has the largest impact on completion and non-financial services are particularly helpful for women and people of color, we recommend more funding should be directed towards non-financial assistance.
- Many apprentices benefit from the Program's coordinated services in which a single point of contact connects apprentices with financial and non-financial support available through the Program as well as additional support available within the trades and in broader communities.
- Hardship funds have increased the retention of apprentices, particularly women and people of color. These services should be expanded.
- Childcare subsidies have a positive impact on completion rates; a strength of the Program's delivery of these subsidies is that friends and family are eligible childcare providers.
- Ready items did not have an impact on completion in the current study period; however, previous evaluations have documented a positive effect. The receipt of ready items is a common way for apprentices to get connected to the coordinated services provided by the Program.
- Gas and travel support are not strongly associated with increased completion in the current or previous study periods; these funds should be reallocated to other service types that are more effective.
- Pre-apprenticeship remains, to date, the only approach that has been empirically documented to increase the recruitment of women into the trades in Oregon (the impact of other approaches, such as school outreach and women in trades fairs has not been assessed). This is a critical tool for increasing the recruitment of a diverse workforce and pre-apprenticeship programs should be expanded.
- Respectful workplace models are expanding across the state. Additional research is needed to demonstrate their effectiveness in reducing jobsite harassment.
- Structural changes beyond the scope of the Program are needed to increase the recruitment and retention of a diverse workforce. Key changes include: addressing equity in access to OJT hours, improving jobsite mentoring and teaching, implementing respectful workplaces models, and creating a system for reporting harassment and discrimination.

Introduction

The Oregon Department of Transportation (ODOT) and Oregon Bureau of Labor and Industries (BOLI) have partnered in a statewide effort—the Highway Construction Workforce Development Program—to recruit, train, and employ a diverse workforce for highway construction jobs throughout the state. This program, begun in 2010, supports a variety of initiatives designed to improve the recruitment and retention of women and people of color in Oregon’s highway construction trades. In the 2020-2021 biennium, ODOT invested a total of about \$2 million in the Program.

As defined by the Program, highway trades include: carpenter, cement mason, ironworker, laborer, operating engineer, and painter.² Where relevant, we also present findings for all trades, which includes the full range of construction, manufacturing, and utilities apprenticeships in Oregon. Further detail on Oregon apprenticeships is available at oregonapprenticeship.org.

The aspects of the Program evaluated in this report include the following: pre-apprenticeship programs, supportive services providing financial assistance (i.e., fuel assistance; support for overnight travel; childcare; work clothes, tools, and protective equipment; hardship funds) and supportive services providing non-financial assistance (i.e., budget class, social support).

This report provides findings based on data from BOLI’s Oregon Apprenticeship System (OAS) and the 2022 Survey of Oregon Apprentices.

Overall, the current evaluation demonstrates the effectiveness of the Highway Construction Workforce Development Program at improving both the recruitment and retention of a diverse workforce over the past decade as well as effectiveness of the program since the last reporting period.

² Inside electricians were added in 2021 but for consistency are not included in the analyses of highway trades apprentices in this report.

Findings from the 2022 Needs Assessment for Oregon’s Highway Trades Apprenticeships

This section summarizes key findings from the *2022 Needs Assessment of the Highway Construction Workforce*, conducted for ODOT and BOLI (Kelly and Benitez 2022). These findings provide context for the evaluation findings in subsequent sections.

Like this evaluation report, the needs assessment draws on OAS data and the 2022 survey of Oregon Apprentices. The needs assessment also draws on interviews with contractors and labor partners. Full text of the needs assessment report can be found at www.maura-kelly.com.

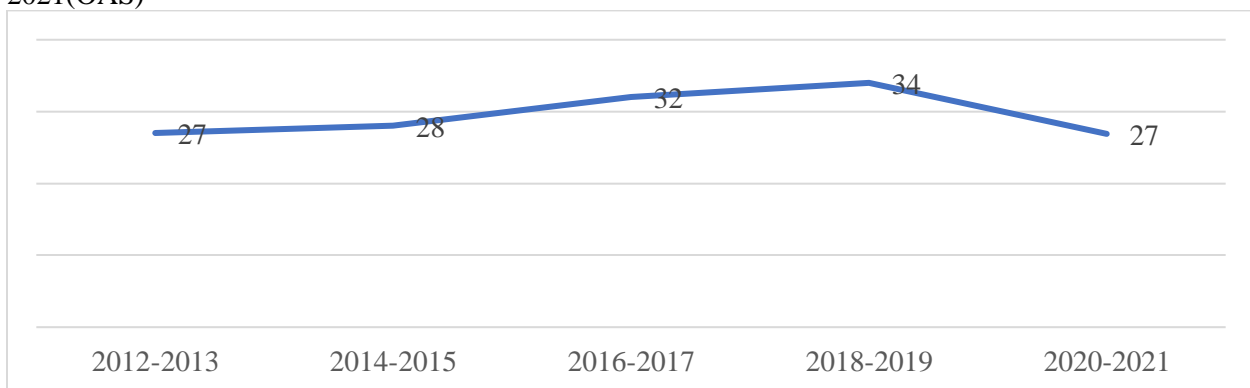
Trends in recruitment

- The Oregon highway trades workforce continues to significantly overrepresent white men, relative to the population of Oregon.
- There was been an *increase* in the percent of new apprentices who are white men from 2014-2019, which is a reversal of the trend of the last few years towards more diverse cohorts of apprentices.

Trends in completion

- The overall completion rates for apprentices who started a highway trades apprenticeship in 2014-2015 was 49%.
- Asian and white men in the 2014-2015 cohort were more likely to complete their apprenticeships compared to most other race/gender groups.
- Completion rates represent declines from 2018-2019 for all race/gender groups except white men and Asian men
- In 2020-2021, the percent of apprentices completing who were women and/or people of color declined due to lower completion rates for women and people of color in 2020-2021 compared to previous years.

Percent of apprentices in highway trades completing who were women and/or people of color, 2010-2021(OAS)



Source: Kelly and Benitez 2022

Apprentices' reasons for leaving apprenticeship

- The most common reasons why apprentices did not complete were: (1) leaving for another opportunity; (2) financial challenges of accessing OJT hours or receiving low pay; (3) problematic jobsite culture; (4) illness, injury, or concerns about safety (not explicitly related to COVID); and (5) poor-quality training.
- The problems most highly correlated with termination related to access to OJT hours and mentorship on jobsites.

Apprentices' problems during apprenticeship

- Apprentices reported a variety of financial challenges that were major or minor problems during apprenticeship, including issues related to housing, income, and access to work hours.
- Apprentices also reported challenges with costs associated with work, such as buying tools, clothing, and PPE, paying for gas, and paying for travel.
- Jobsite culture presented problems for many apprentices. The most common jobsite issues were (1) Being treated disrespectfully; (2) Lack of mentorship and learning on the job; (3) Being yelled at; (4) Being unfairly assigned tasks not related to the skills of the trade; and (5) Hearing offensive jokes or comments.
- Women and people of color were more likely to report both financial and jobsite problems.
- While few participants reported that Covid-19 was the reason they left their apprenticeship, a majority of survey participants reported that Covid-19 was a major or minor problem during their apprenticeship.

Apprentices and childcare

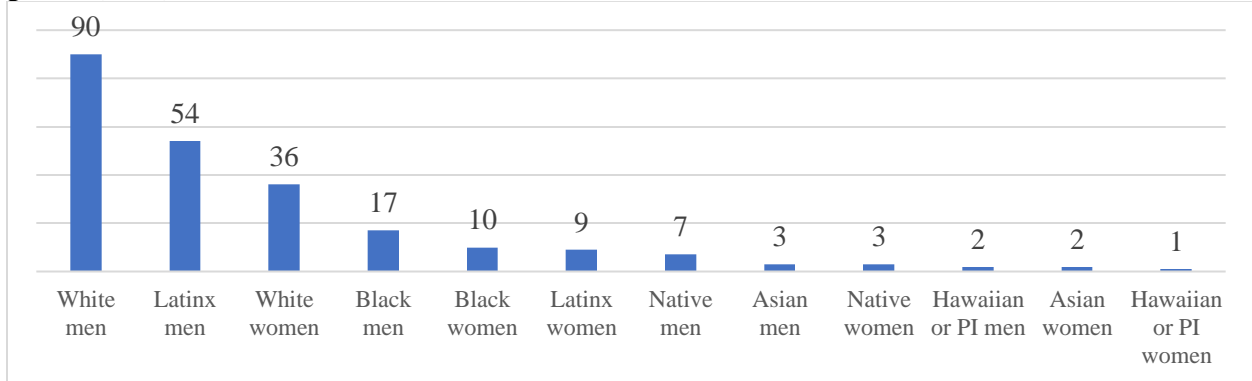
- Both finding consistent childcare as well as paying for the cost of childcare was a problem for many apprentices.
- In the survey sample, fathers had a higher completion rate than men who were not fathers while mothers had a lower completion rate than women who were not mothers. Additionally, fathers were more likely than mothers to complete.
- Those who completed an apprenticeship were more likely than those who terminated to use *unpaid* childcare, relying on either a partner, children's other parent, family, or friends. Those who terminated were more likely to rely on paid childcare as their primary form of childcare.

Impact of Program services

Participation in the Highway Construction Workforce Development Program

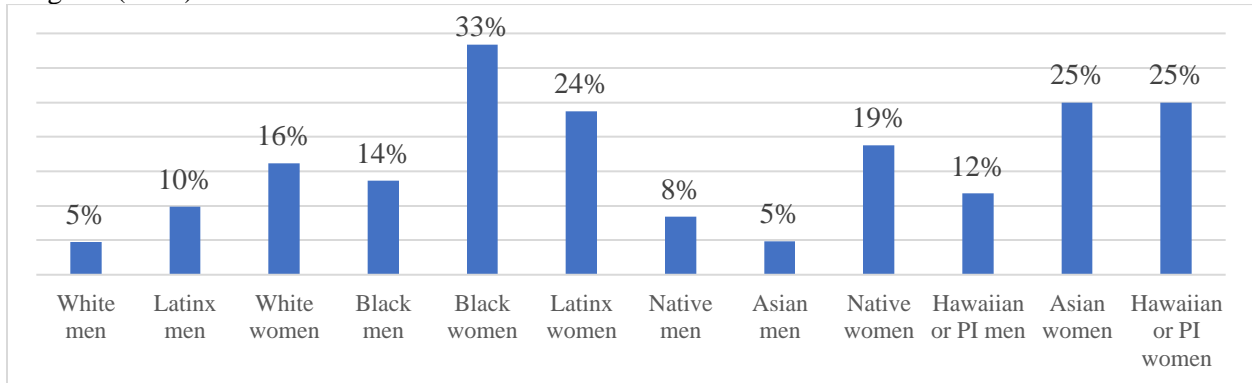
This portion of the analysis assesses the most recent cohort of apprentices. A total of **234 highway trades apprentices who started an apprenticeship in 2020-2021 received any services through the Program.**

Number of highway trades apprentices in the 2020-2021 cohort served by the Program, by race and gender (OAS)



As shown below, at least 16% of women in each racial group received services, with women of color the most likely to receive services.

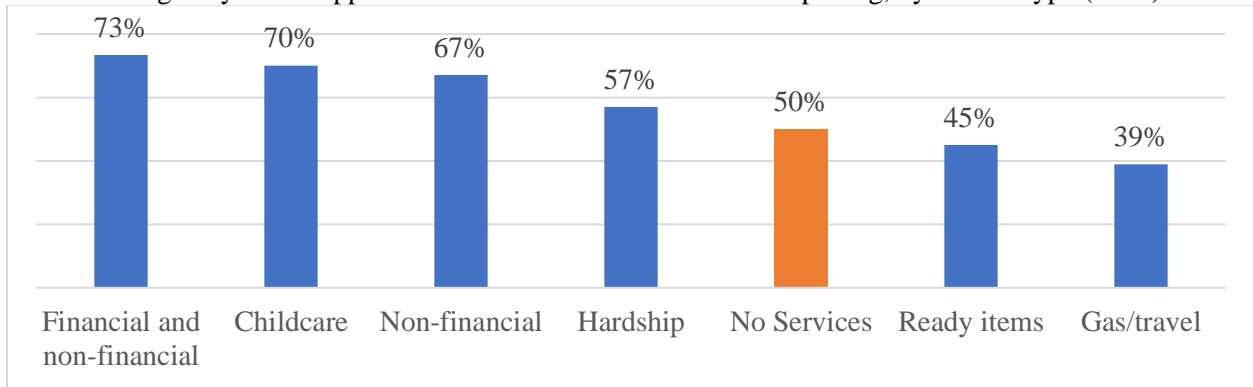
Percent of highway trades apprentices in the 2020-2021 cohort in each race/gender group served by the Program (OAS)



Impact of financial and non-financial support on completion

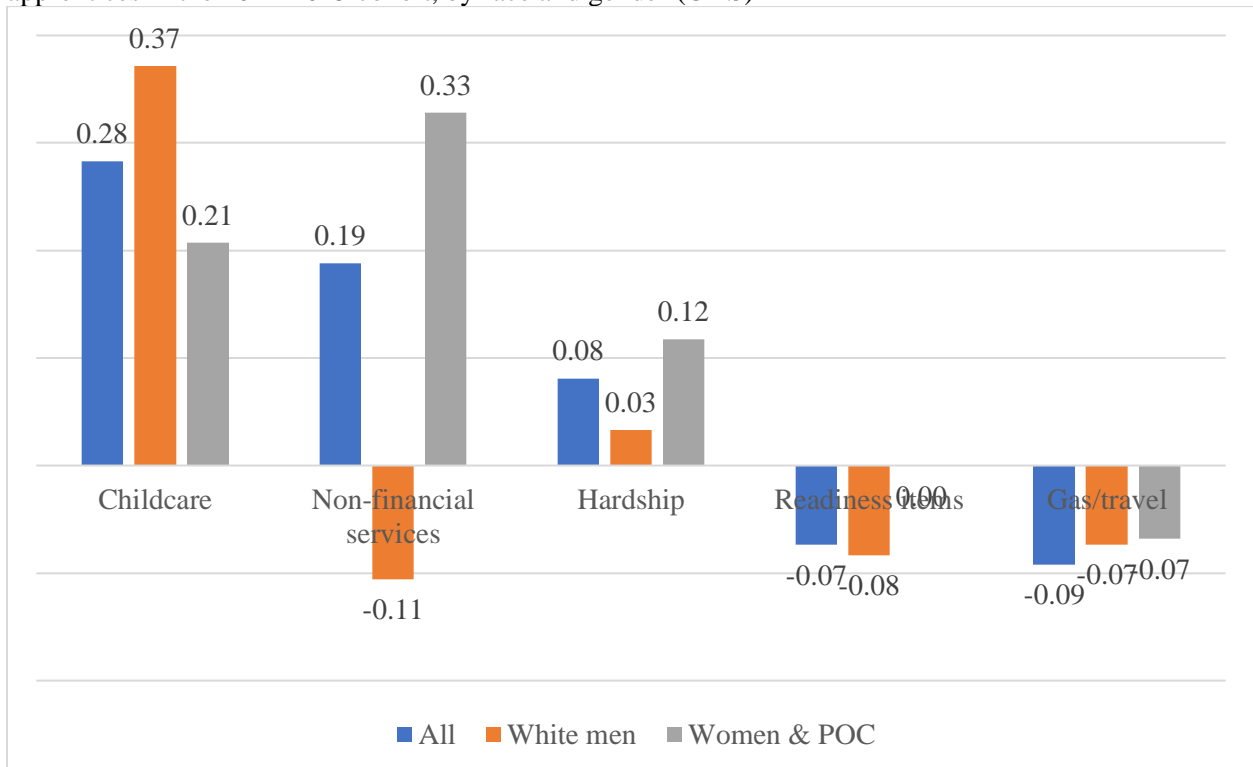
This section provides an analysis of the completion rates for highway trades apprentices who started in 2014-2015 (almost all had either completed or terminated by the end of 2021). **The Highway Construction Workforce Development Program continues to improve completion rates for apprentices who receive services.** Additionally, **receiving both financial and non-financial services had the largest impact on completion, followed by child care subsidies, non-financial services, and hardship funds; readiness items and gas/travel did not have a positive impact on completion.**

Percent of highway trades apprentices in the 2014-2015 cohort completing, by service type (OAS)



Notably, some race and gender differences emerge: Childcare has a larger positive impact on completion rates of white men compared to women and people of color. As shown below, white men who receive childcare subsidies are 37% more likely to complete their apprentices than white men who do not receive this support; women and people of color who receive childcare subsidies are 21% more likely to complete. Non-financial services and hardship funds had a larger positive impact on completion rates for women and people of color compared to white men.

Marginal effects of each service type, net of other service types, on completion rates of highway trades apprentices in the 2014-2015 cohort, by race and gender (OAS)



Apprentices’ perspectives on the Program

In our 2022 survey of Oregon apprentices, we contacted all apprentices who completed or terminated in 2020 and 2021 who had received services from the Program. In total, 46 survey participants reported receiving any services, 35 people reported non-financial support from Penny Painter, and seven people reported they received hardship funds. We asked these apprentices about the support they received and how it helped them

How apprentices benefitted from support from the Program

When asked how the support services helped, apprentices listed the program’s financial support most often, followed by assistance getting their career started. A few participants described non-financial forms of support, which is discussed below.

How Program services helped apprentices (2022 Survey of Oregon Apprentices)

<i>Code (Frequency)</i>	<i>Selected quotes</i>
Financial support (28)	<p><i>It helped tremendously; I didn't have much money at the time.</i></p> <p><i>It was incredible, I was pretty poor to start</i></p>
Getting started in apprenticeship (16)	<p><i>It helped me because just getting started is expensive</i></p> <p><i>It helped me tremendously to get started, the childcare helped a ton</i></p> <p><i>Coming straight out of high school, I didn't have anything. It was great to get the rain gear especially.</i></p> <p><i>It really got me started and informed, made me feel like someone wants me to be successful</i></p>

Three participants offered negative feedback about the program: *“Would have been handier to have some of the items while attending apprenticeship classes instead of waiting for a job.”* and *Penny Painter helped me get my first hand tools, but it ended up being the wrong tools. It took me 6 months to buy it on my own”* and *It was sort of unhelpful. I had to use Akana to buy my tools/etc but it was mandated by the person in charge what I could get. I wish I had been given the ability to purchase what I wanted or needed.”* As noted in the table above, some apprentices reported that they *didn’t* know what to buy and that advice was helpful.

Apprentices who received support were also surveyed on how texts or calls with Penny Painter helped them, as the “Penny Painter effect” was noted in the 2020 evaluation of the Program (Kelly and Wilkinson 2020), see box below.

The Penny Painter Effect

...I will say that Penny was the most amazing person, that if it wasn't for her, I wouldn't have stayed in the construction industry, to be a hundred percent honest. If it wasn't for Penny, I wouldn't be working for the union... When I had first started, I was having that problem with the racial experience [racism on the jobsite]. And she was explaining to me, and talking to me about stuff, and how we don't have a lot of minority leaders in leading positions, and how that sometimes we have to go through hard stuff. And at the end of it, it all is worth it, and sometimes it's not. But you'll never know if you just stop. And she told me that she had this money to help me get the clothes, and she helped me buy my boots. I didn't have money for steel toed boots. I was working in the rain and I didn't have any rain gear. I was soaking wet every day and just miserable, and she made sure that I had everything that I needed for that year. And it really changed my perspective on them, on the union, and how to go about life (Black man, completed, 2020 interview).

Source: Kelly and Wilkinson 2020

In the 2022 survey, apprentices who received any support from the Program were asked if they recalled calls, texts, or meetings with Penny Painter and, if so, how that had helped them. Apprentices equally reported financial and non-financial assistance as being most helpful. The way Penny Painter helps navigate apprentices through the apprenticeship program process, as well as her guidance on purchasing tools and equipment, were frequently cited.

As in a previous evaluation of the Program (Kelly and Wilkinson 2020), we found the administrative data undercounts how many apprentices received non-financial support. Many apprentices who were not recorded in the administrative data as receiving non-financial services reported that they received non-financial help in response to the question about how calls, texts, and meetings with Penny Painter helped them. This is because this non-financial support is provided when apprentices contact the Program for financial support. Some participants commented on both financial and non-financial components of the support, such as *“It helped me be able to perform the job and be confident and keep up.”*

How texts or calls with Penny Painter helped apprentices

<i>Code (Frequency)</i>	<i>Selected quotes</i>
Financial help (13)	<p><i>It provided me with a way to pay rent.</i></p> <p><i>Penny got me the boots and tools, she helped with child care</i></p> <p><i>Penny really helped me get the tools I needed. And the day before I was going to start work, she took me shopping to get everything I needed.</i></p>
Non-financial help (13)	<p><i>Penny Painter was super helpful. When you're an apprentice you don't know what you need. She gave me a list of what you need.</i></p> <p><i>Penny gave really great advice.</i></p> <p><i>Penny was able to answer all the questions that I had, very elaborate in giving instructions.</i></p> <p><i>Penny helped me figure out the paperwork.</i></p> <p><i>Penny is VERY supportive and encouraging.</i></p>

A few participants reported challenges interacting with Penny Painter. As one apprentice noted: *“I appreciated the help she gave, but her attitude and people-skills are not the best. Sometimes when you ask a question, she treats you like you're a dumbass.”* Others noted that they appreciated Penny

Painter’s approach, with comments such as: “*She’s been in the field a long time and assists you as needed. She tells it like it is.*” and “*She doesn’t sugarcoat anything, she talks to us like one of the guys.*”

Seven of the survey respondents had received hardship funds, reporting that they were used for rent, replacing stolen tools, assistance with car repairs, and to support an apprentice during a divorce. One participant reported receiving assistance with rent after being laid off during the pandemic “*It was awesome. I applied for it since I was low on money to pay rent and they paid my next month’s rent within days.*” Another apprentice reported “*I got into a car accident and couldn’t pay my rent, they help pay it... it really helped me after my car accident.*” Another apprentice noted that it helped because “*I needed to get my stolen tools replaced.*” Of the seven apprentices who received hardship funds, six completed their apprenticeship and one person left their apprenticeship, reporting it was because they relocated.

How Program services can be improved

When asked how Program services could be improved, apprentices offered many ideas, mostly suggesting expansion of current services, followed by specific changes to current services. As noted above, some apprentices noted they would prefer fewer restrictions on the tools, clothing, and PPE they could buy with Program funds, but others noted that they needed advice on what to buy. Finally, apprentices noted that the Program should work to increase apprentice awareness of these services, including by delivering presentations of offered services to apprentices.

How Program services be improved

<i>Code (Frequency)</i>	<i>Selected quotes</i>
Expand current services (8)	<p><i>There’s a lot of travel, so we need something to help offset the cost of travel or travel incentives.</i></p> <p><i>There could be more outreach and contact with the apprentices.</i></p> <p><i>Penny is great and stuff, but we need more mentoring.</i></p> <p><i>There could be better financial support childcare.</i></p>
Specific changes to current services (7)	<p><i>It can be uncomfortable to fill out forms and find the services info, make it easier to access.</i></p> <p><i>It could be improved by working with Washington state.</i></p> <p><i>If there was something like a waiver or parking pass for the area, that’d be great.</i></p>
Increase awareness of services (4)	<p><i>The Program could advertise services to apprentices better. Many have no idea of the support they can be given through the program.</i></p> <p><i>It could be improved by making services more known, so apprentices know they have options, even before the apprenticeship</i></p> <p><i>Get the word out on all the programs and help they have. Have reps come down to the apprenticeships to explain what they offer.</i></p>

Financial and non-financial support from other sources

In previous research, we used qualitative interviews with former apprentices to better understand the scope of support that apprentices received, in addition to support through the Program (see Kelly and Wilkinson 2020). Below, we present these additional sources of support reported by apprentices who received services through the Program (table from Kelly and Wilkinson 2020). As noted in the 2020 report, we found that **apprentices who completed their apprenticeship were more likely than those who terminated to have received financial support from unemployment and from family or friends**. Completed and terminated apprentices were similar in their access to all other types of financial support. In comparing access to non-financial support, **apprentices who completed were more likely than those who terminated to receive non-financial support from every source**. The largest differences were for support from family and friends, apprenticeship staff, and employer staff.

These findings provide further evidence that non-financial support from within the trades (as well as outside the trades) is an important predictor of apprentices' success in the trades.

Sources of support received by apprentices, as reported (2020 interviews with Oregon apprentices)

<i>Financial support</i>	<i>Non-financial support</i>
Unemployment	Partner
Family/friends	Family/friends
Public assistance	Tradespeople/coworkers
Employer	Union staff
Apprenticeship	Apprenticeship staff
Union	Employer staff
	Church, faith, God
	Other non-profit

Note: Questions about church, faith, or God and other non-profits were not asked to all participants but were mentioned by some participants when asked about any other supports they had experienced.

Source: Kelly and Wilkinson 2020

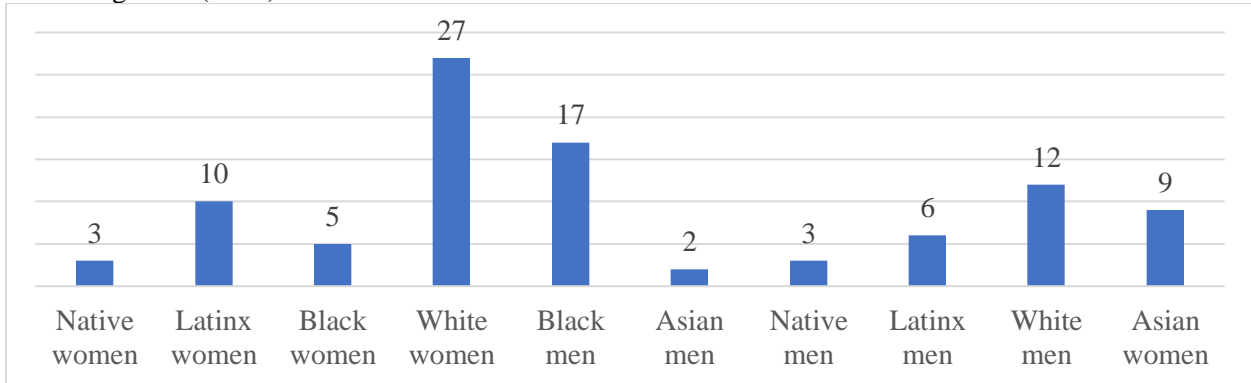
Impact of pre-apprenticeship

Oregon pre-apprenticeship programs have a variety of sources of funding, including the Program. Pre-apprenticeship programs supported by the Program in 2020-2021 include Oregon Tradeswomen, Constructing Hope, and Portland YouthBuilders as well as trades-specific pre-apprenticeships (see Appendix for all program contracts). In these analyses, we examine the 2014-2015 cohort of apprentices.

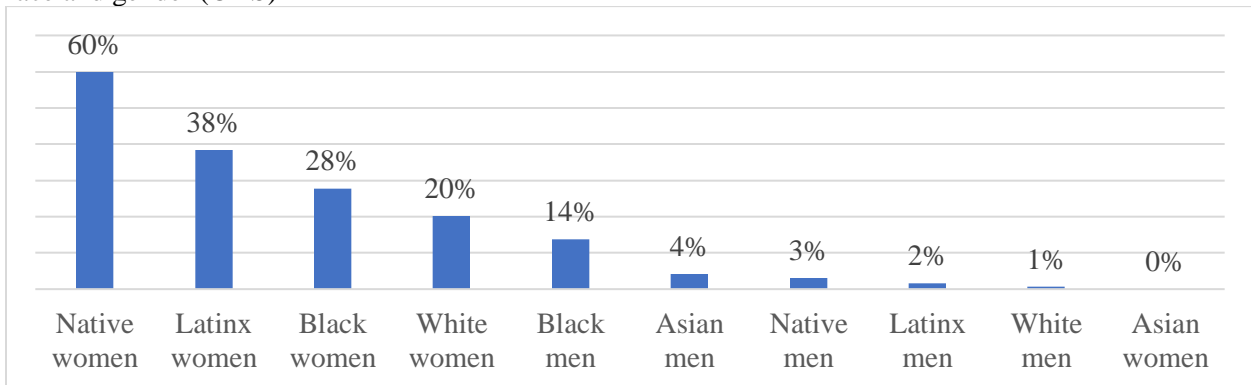
Participation in pre-apprenticeship

Pre-apprenticeship programs have contributed to the diversifying the highway construction trades workforce, particularly through recruiting women and Black men. We find that 27% of all women and 14% of Black men entered via pre-apprenticeship.

Number of highway trades apprentices in the 2014-2015 cohort who completed a pre-apprenticeship, by race and gender (OAS)

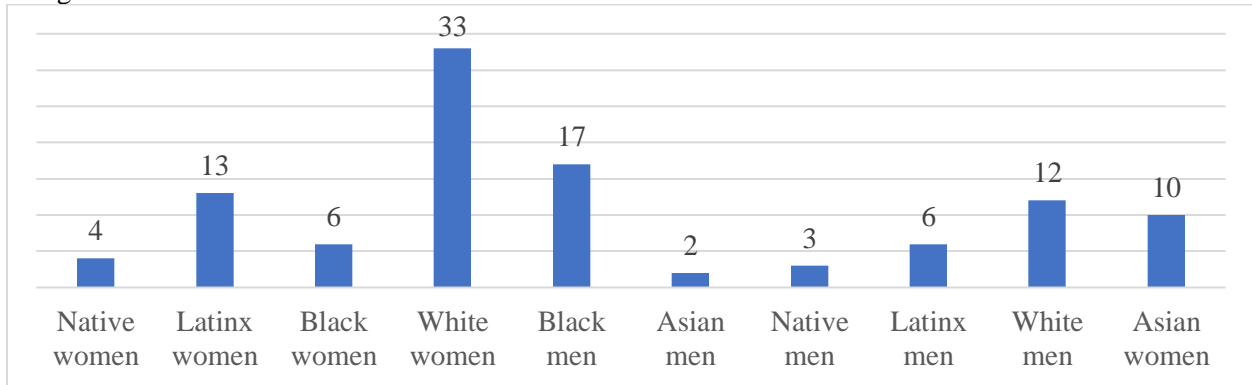


Percent of highway trades apprentices in the 2014-2015 cohort who completed a pre-apprenticeship, by race and gender (OAS)

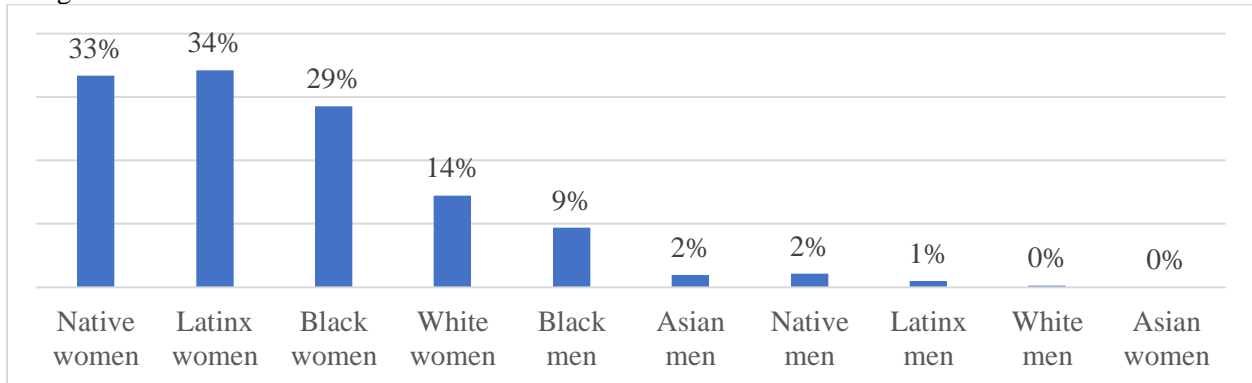


As shown below, the trends for all trades are similar to the highway trades. Overall, 66 women (21% of all women) in all trades entered via a pre-apprenticeship.

Number of apprentices in all trades in the 2014-2015 cohort who completed a pre-apprenticeship by race and gender



Percent of apprentices in all trades in the 2014-2015 cohort who completed a pre-apprenticeship, by race and gender



Impact of pre-apprenticeship on completion

Additionally, **pre-apprenticeship has a positive impact on completion rates for white women, Black women, and Latinx men** (analysis not shown). It is unsurprising to see a lack of positive effect of pre-apprenticeship for other race/gender groups as pre-apprenticeship programs generally serve individuals with less experience in the trades and more challenges than individuals who enter directly into apprenticeship.

Respectful workplaces

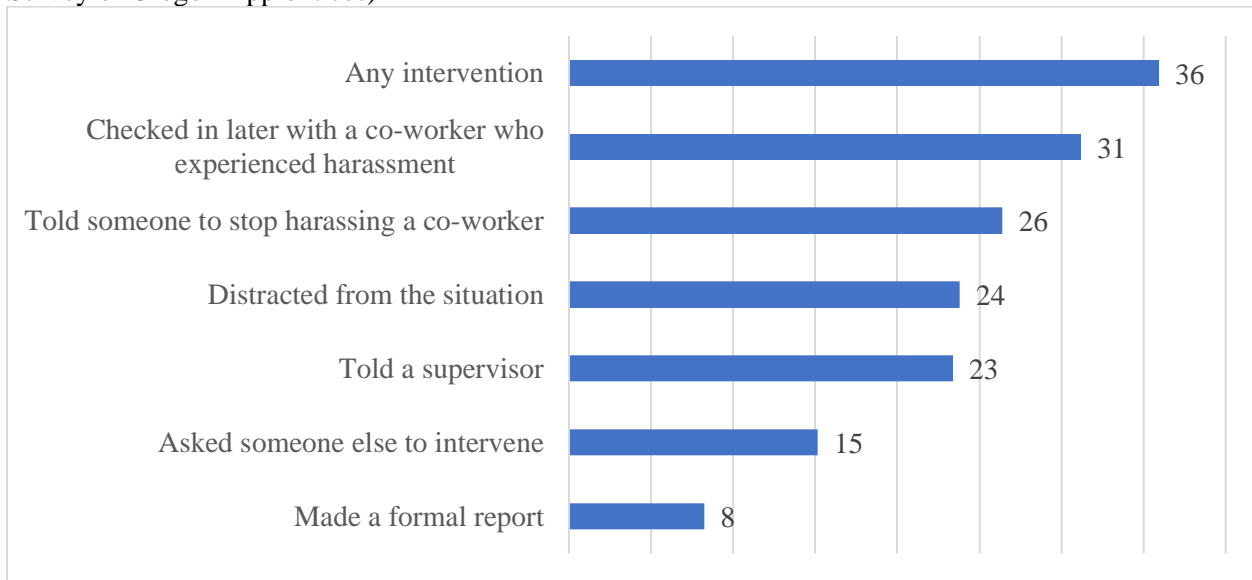
Participation in respectful workplace programs

Participants in the 2022 Survey of Oregon Apprentices were asked about their exposure to respectful workplace programs. A total of about 18% of apprentices had participated in any respectful workplace programs. These included PNCI’s positive jobsite culture (7%), Green Dot for the Trades (4%), RISE Up (3%), and others (6%).

Intervening in response to harassment on the job

All apprentices were asked about their experience responding to harassment on the job. **About a third of workers reported intervening in response to harassment at least once during their apprenticeship.** The most common types of interventions were delaying, intervening by checking in later with someone who had been harassed, directly intervening by telling someone to stop harassing, distracting from the situation, and delaying intervening by bringing the issue to a supervisor.

Percent of workers who intervened in response to jobsite harassment, by type of intervention (2022 Survey of Oregon Apprentices)



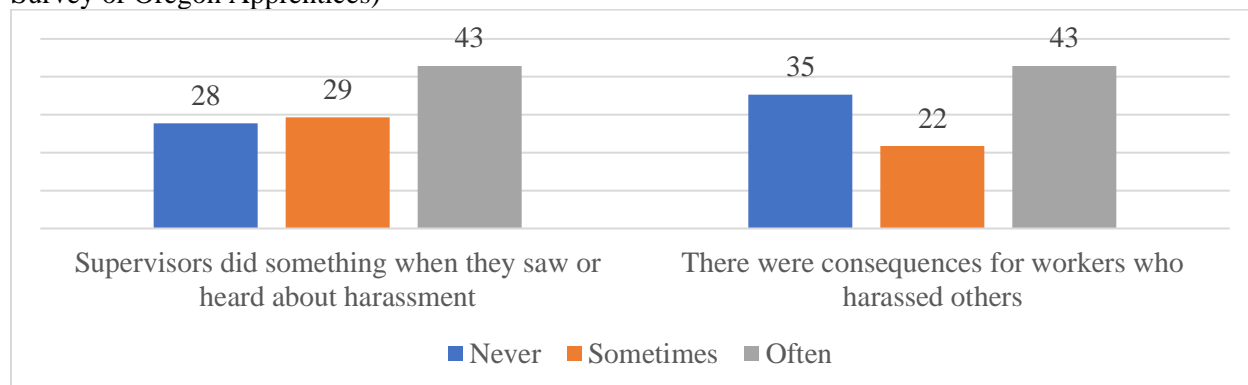
In further analyses (not shown), we find that participants who reported receiving Green Dot and RISE up respectful workplaces were *not* more likely to intervene than those who did not receive this training; however, **apprentices who reported participating in the Pacific Northwest Carpenters Institute (PNCI) Positive Jobsite Culture training were more likely to intervene than those who had not participated.** The data showed that 34% of apprentices who had not participated in any respectful workplace trainings had intervened, compared to 59% of apprentices who had participated in the PNCI training (analysis not shown).

Supervisors' responses to jobsite harassment

When apprentices were asked if they observed supervisor responses to harassment, apprentices were divided on whether this occurred often, sometimes, or never. For example, when asked if supervisors did something when they saw or heard about harassment, 43% reported often, 29% reported sometimes, and 28% reported never. Thus, responses to harassment were uneven across the sample of apprentices, with some apprentices perceived a lack of responsiveness to jobsite harassment while others perceived that appropriate responses generally do happen when harassment occurs. In additional analyses (not shown), white men and women of color reported that responses to harassment were more frequent, compared to white women and men of color.

Ultimately, respectful workplace initiatives will not be effective in reducing jobsite harassment levels if supervisors do not respond to instances of harassment and there are no consequences for workers who harass others.

Percent of workers who reported seeing responses to harassment never, sometimes, and often (2022 Survey of Oregon Apprentices)



Recommendations

Overall, pre-apprenticeship and supportive services funded by the Highway Construction Workforce Development Program are increasing the recruitment and retention of a diverse workforce. Recommendations for specific components of the program are provided below. Additionally, as the Program only serves apprentices in the highway trades, with additional funding from other sources, this could be expanded to provide services for all apprentices.

Non-financial support

As found in previous evaluations (Kelly and Wilkinson 2020), the largest impact on completion rates is found when apprentices receive both financial and non-financial services. Many more apprentices received non-financial support than reflected in these analyses as delivery of non-financial support is difficult to track, particularly with frequent informal contacts via phone or text. This makes the full impact of non-financial support that is provided as a result of providing financial support difficult to evaluate.

These findings from the survey as well as 2020 interviews with apprentices (Kelly and Wilkinson 2020) suggest that many apprentices would benefit from coordinated services that connect apprentices with financial and non-financial support available within the trades and in broader communities with a single point of contact. The Program's successful delivery of coordinated services could be replicated by other industry partners (e.g. contractors, apprenticeship programs, unions) who would like to increase the completion rates of apprentices.

This approach could be expanded to be a “wrap around” service model in which each participant’s full set of needs is assessed, a plan to comprehensively address those needs is formed, and the participant is connected with all relevant information and services within and outside the trades.

Recommended changes to the Program

Overall, pre-apprenticeship and supportive services funded by the Highway Construction Workforce Development Program are increasing the recruitment and retention of a diverse workforce and these efforts should be continued.

As the combination of financial and non-financial services has the largest impact on completion and non-financial services are particularly helpful for women and people of color, we recommend more funding should be directed towards non-financial assistance.

Many apprentices benefit from the Program's coordinated services in which a single point of contact connects apprentices with financial and non-financial support available through the Program as well as additional support available within the trades and in broader communities.

Hardship funds have increased the retention of apprentices, particularly women and people of color. These services should be expanded.

Childcare subsidies have a positive impact on completion rates; a strength of the Program's delivery of these subsidies is that friends and family are eligible childcare providers.

Ready items did not have an impact on completion in the current study period; however, previous evaluations have documented a positive effect. The receipt of ready items is a common way for apprentices to get connected to the coordinated services provided by the Program.

Gas and travel support are not strongly associated with increased completion in the current or previous study periods; these funds should be reallocated to other service types that are more effective.

Pre-apprenticeship remains, to date, the only approach that has been empirically documented to increase the recruitment of women into the trades in Oregon (the impact of other approaches, such as school outreach and women in trades fairs has not been assessed). This is a critical tool for increasing the recruitment of a diverse workforce and pre-apprenticeship programs should be expanded.

Respectful workplace models are expanding across the state. Additional research is needed to demonstrate their effectiveness in reducing jobsite harassment.

Structural changes beyond the scope of the Program are needed to increase the recruitment and retention of a diverse workforce. Key changes include: addressing equity in access to OJT hours, improving jobsite mentoring and teaching, implementing respectful workplaces models, and creating a system for reporting harassment and discrimination.

Hardship funds

Analysis of the impact of hardship funds show that this type of support has increased the retention of apprentices, particularly women and people of color. Hardship funds have been used to address apprentices' one-time needs, such as assistance with rent, car repairs, and stolen tools. These are all challenges that could potentially push apprentices out of the trades; hardship funds can play a critical role in retaining apprentices with these types of issues.

Childcare

The findings of 2022 Survey of Oregon Apprentices show that both mothers and fathers reported that consistent childcare as well as paying for the cost of childcare was a problem. The challenge of parenting has a larger impact on women: Fathers had a higher completion rate than men who are not fathers while mothers had a lower completion rate than women who are not mothers. In assessing the relationship between types of child care used and completion, those who completed an apprenticeship were more likely to use unpaid childcare, relying on either a partner, children's other parent, family, or friends.

Given these substantial challenges of parents (and the disproportionate impact on mothers), addressing childcare will be a critical tool for increasing retention. Survey findings show that providing childcare subsidies increases the likelihood of completion, women and people of color who receive childcare subsidies are 21% more likely to complete, and white men who received this support were 37% more likely to complete.

Notably, childcare subsidies is the type of service that has the largest positive impact on completion (second only to the combination of both financial and non-financial services). This type of service should be continued or expanded to keep child care costs at no more than 7% of household income, as recommended by the 2020 Oregon Joint Task Force on Access to Quality Affordable Child Care.

One specific strength of the approach to childcare subsidies taken by program is that friends and family are eligible childcare providers. This type of childcare arrangement is particularly likely to positively impact completion, as indicated by the findings that apprentices who complete are most likely to rely on family or friends.

Ready items

As noted in this report, financial support for ready items did not have a significant impact on completion. Previous evaluations of the impact of ready items in the 2008-2013 cohorts did find a positive impact of ready items on completion, with a larger impact on completion of white men than women and people of color (Kelly and Wilkinson 2020). It could be that the decreased completion rates for the 2014-2015 cohort may be interacting with the impact of service receipt. another explanation for this shift could be a change in the criteria for receiving ready items. Starting January 2015, ready items were only provided to apprentices in their first year. It may be that there is an unmet need for ready items among apprentices in the second year and beyond.

The investment in ready items has some additional functions. First is to provide a sense of the industry investing in them. As one apprentices reported on the 2022 survey, receiving support from the Program “*made me feel like someone wants me to be successful.*” Additionally, receiving ready items is a common way that apprentices initially connect with the Program. In an informal conversation with Penny Painter in 2022, Penny expressed concern about an apprentice she had recently met to buy ready items. To paraphrase her concluding thoughts, she said “at least she has my number and can call or text me when something happens.”

While the findings for the present study provide some support for reallocating funding for ready items to other service types that are more effective, the impact previously documented should also be taken into account. If this service type is continued, it would be helpful to work with apprenticeship programs to better understand what types of ready items apprentices need at the start of apprenticeship and what items, such as specialized tools, they might need later in apprenticeship. The Program might then evaluate the need for ready items for apprentices in year two and beyond on a case-by-case basis. Additionally an evaluation of future cohorts will reveal whether the lack of impact of ready items in the 2014-2015 is a lasting trend.

Outside of the Program, pre-apprenticeship programs, apprenticeship programs, unions, and contractors could assess their apprentices' needs for ready items prior to starting work. Additionally, public owners could contractually require contractors to ensure that apprentices have access to the tools, clothing (e.g. rain gear), and equipment needed for the work they will perform on the jobsite as part of the onboarding process.

Travel support

Funds for gas and travel did not have a significant impact on completion in the current study period or in our previous evaluation (Kelly and Wilkinson 2020). These funds should be reallocated to other service types that are more effective.

Pre-apprenticeship

Pre-apprenticeship remains, to date, the only approach that has been empirically documented to increase the recruitment of women into the trades in Oregon (the impact of other approaches, such as school outreach and women in trades fairs has not been assessed). Between 2008 and 2019, 16% of white women and 20% of women of color entered into apprenticeship via pre-apprenticeship (Kelly and Wilkinson 2020). The number of pre-apprenticeship programs (and reporting for these programs) for 2020-2021 has been impacted by Covid and is not reported here.

Respectful workplaces

Previous research³ on Green Dot (Kelly and Wilkinson 2020, Kelly and Mackin Freeman 2022) and Rise Up (Kelly 2022)⁴ gathered through jobsite surveys has demonstrated that respectful workplaces implemented on construction jobsites are consistently effective in increasing workers' ability to intervene in response to harassment on jobsites.

As noted above, the current survey finding that participating in Green Dot and RISE Up does *not* correlate with increased likelihood of intervening. The reasons for these trends is unclear, given the findings from prior research. It may be that too few apprentices who have engaged with these models were surveyed to detect trends: 4% of the sample reported participating in Green Dot for the Trades and 3% in RISE Up. While the percent of apprentices who have engaged in these models during the study period was small, a significant increase is expected in coming years, given that the implementation of these programs in Oregon is quickly expanding.

It was notable that the PNCCI Positive Jobsite Culture *was* correlated with an increased likelihood of intervening. One reason for this may be that apprentices engaging with this model had a more in depth and ongoing engagement with the Positive Jobsite Culture taught in apprenticeship classes compared to other apprentices' engagement with models implemented on jobsites. Specifically, this ability to provide a more robust implementation of this training may be attributed to it being logistically easier to deliver training in apprenticeship classroom settings than on jobsites.

³ Full reports and a 2022 fact sheet summarizing respectful workplaces research to date is available at www.maura-kelly.com

⁴ This evaluation assessed the effectiveness of the City of Seattle's acceptable worksite trainings, which were based on the RISE Up program.

Additionally, working on jobsites with other carpenter apprentice and journey worker “union siblings” who have completed the same training may increase carpenter apprentices’ ability to intervene in response to harassment. Further, these workers may see themselves as more invested in the well-being of others in their union with whom they may have long term relationships, compared to others who may anticipate only short-term relationships with coworkers on specific jobsites.

As noted in the recommendations for previous evaluation of respectful worksites implementations, there is significant promise in these respectful workplace models for reducing jobsite harassment. However, in order to increase workers’ ability to intervene and, ultimately, bring down jobsite harassment, these programs will need to follow recommendations for the program being implemented, including in-depth coverage of the content (e.g. 60 minute training sessions for 100% of supervisors and 20% of all workers on site at all times) as well as ongoing booster sessions (e.g. 5-10 minute job box talks once a month) and ongoing visual reminders (e.g. posters or stickers on the jobsite). Additional research is needed to assess the impact of respectful workplace models on specific jobsites as well as the impact on apprentices across the trades.

Further, in order to fully implement a respectful workplace model, contractors need to address policies and practices to demonstrate to workers that there are consequences for harassment. One measure of this for future evaluations will be the percent of workers who agree to statements such as “Supervisors did something when they saw or heard about harassment” and “There were consequences for workers who harassed others.”

Structural changes

It is important to note that many of the challenges apprentices face are outside the scope of issues that can be directly addressed through the Program. The box below shows suggestions for the industry from the 2022 Needs Assessment (Kelly and Benitez 2022). These recommendations are consistent with the recommendations from our previous evaluations of the Program (Kelly and Wilkinson 2020, Wilkinson and Kelly 2018) as well as the recent Metro Market Study (2018).

Recommended structural changes

- | |
|--|
| <ul style="list-style-type: none">Expand efforts to recruit a diverse construction workforceRevise current processes for assigning work to ensure equitable access to on-the-job hours for women and people of colorPromote respectful workplaces through employer policies and worker trainingsCreate a system for reporting harassment and discrimination across jobsitesPromote teaching and mentorship through employer policies and worker training.Provide opportunities for apprentices to rotate out of jobs where they are not learning the skills of the tradeProvide additional flexibility in work schedules and provide opportunities for apprentices to rotate out of jobs that are not a good fitIncrease understanding of challenges across stakeholder groupsIncrease understanding across stakeholder groups |
|--|

Source: Kelly and Benitez 2022

The Program has provided models for the implementation of initiatives to support the recruitment and retention of a diverse workforce that can be replicated by other stakeholders. Additionally, the successes of Program can inform other initiatives, such as expanding pre-apprenticeship, extending respectful workplace models on jobsites throughout the state, the Safe from Hate coalition, and public owner approaches to community workforce agreements.

References

Find Dr. Maura Kelly's research at maura-kelly.com

- Haines, Kelly, Jeana Wooley, Tiffany Thompson, Connie Ashbrook, and Maura Kelly. 2018. Portland Metro Region Construction Workforce Market Study <https://www.oregonmetro.gov/sites/default/files/2018/07/02/C2P2-regional-construction-workforce-market-study-07022018.pdf>
- Kelly, Maura and Daniel Mackin Freeman. 2022. *Evaluation of Green Dot for the Trades for TriMet*. Final report submitted to TriMet.
- Kelly, Maura and Lindsey Wilkinson. 2020. *2020 Evaluation of the Highway Construction Workforce Development Program*. Final report submitted to Oregon Labor and Industries and Oregon Department of Transportation.
- Kelly, Maura and Lindsey Wilkinson. 2020. *Evaluation of Green Dot for the Trades*. Final report submitted to Oregon Tradeswomen.
- Kelly, Maura. 2022. Assessing the Effectiveness of Acceptable Worksite Trainings: Evaluation Conducted for the City of Seattle. Final report submitted to the City of Seattle.
- State of Oregon Legislative Policy and Research Office. 2020. *Joint Task Force on Access to Quality Affordable Child Care*. Available at: https://www.oregonlegislature.gov/citizen_engagement/Reports/Access%20to%20Quality%20Affordable%20Child%20Care%20Final%20Report.pdf
- White, Ian R., Patrick Royston, and Angela M. Wood. 2011. "Multiple Imputation Using Chained Equations: Issues and Guidance for Practice." *Statistics in Medicine* 30(4):377–99.
- Wilkinson, Lindsey and Maura Kelly. 2018. *Continuing to Build a More Diverse Workforce in the Highway Trades: 2018 Evaluation of the ODOT/BOLI Highway Construction Workforce Development Program*.

APPENDIX A. Research design

Administrative data

This evaluation draws on data from BOLI's Oregon Apprenticeship System (OAS) database of registered apprentices. This data includes apprentices' gender, race, age, status (completed, terminated, active), start and end dates, union status, and trade. Additional Program participation data includes type of service provided. Apprentices who canceled with zero credit hours and apprentices with a status other than completed, terminated, or active were excluded from analyses. Missing data was accounted for using the multiple imputation by the MICE system of chained equations (White, Royston, and Wood 2011).

2022 Survey of Oregon Apprentices

The 2022 Survey of Oregon Apprentices was funded by the Oregon Department of Transportation and the Oregon Bureau of Labor and Industries through the Program. This data was gathered to evaluate the impact of the financial and non-financial services to apprentices offered through the Highway Construction Workforce Development Program as well as obtain information about apprentices' perceptions about apprentices' challenges and the needs of the industry (see Kelly and Benitez 2022 for the needs assessment report). The survey was developed and conducted by the author with additional assistance from graduate research assistants.

Data collection occurred between April and June 2022. Participants were initially offered a \$5 incentive for completing the survey. After a low response rate in the first two weeks of administering the survey, the incentive was increased to \$10.

The population for the survey was all individuals who either completed or terminated a registered apprenticeship in Oregon in 2020 or 2021. OAS data included names and telephone numbers for all apprentices in the population. An unknown percent of these telephone numbers were no longer correct when called by the research team, because apprentices moved (landlines) or changed numbers (cell phone) since leaving their apprenticeship. Many, but not all, phone numbers in the OAS data were cell phones.

All apprentices in the population were sent a link to the Qualtrics survey via text (N=5886). A total of 134 apprentices completed the survey after being contacted via text (2.3% response rate for text survey). A stratified sample of apprentices who did not respond to the initial text (and did not opt out of additional contact from the research team) were sent a second text. Those who didn't respond to the second text were contacted via telephone. This stratified sample included all apprentices who received services through the Program, all women apprentices, all apprentices of color, and a random sample of white men apprentices. A total of 1033 apprentices were called and 97 participants completed the survey over the telephone with a member of the research team (9.4% response rate for telephone survey). A total of 231 former apprentices completed the survey.

Apprentice who received services were asked questions about how the services helped them and suggested changes to the program. All apprentices were asked questions about the reasons they left their program (for those who terminated), their job after apprenticeship, why they chose a

union or non-union program, the challenges they experienced, experiences of jobsite harassment, how Covid impacted their apprenticeship experience, childcare arrangements, suggested changes to the industry, and demographic questions (gender, race, age, status (completed, terminated, active), start and end dates, union status, and trade.

Demographics

Demographics of apprentices completing or terminating in 2020-2021

<i>Demographic</i>	<i>Survey sample</i>	<i>All trades</i>	<i>Highway trades</i>
Status (%)			
Completed	70	56	52
Pre-apprentice (%)			
Completed pre-app	13	1	1
Program services (%)			
Received services	20	6	11
Union status (%)			
Union	63	53	64
Non-union	37	40	36
Mixed	-	6	-
Race (%)			
White	67	75	72
Latinx	18	16	17
Black	5	4	5
Asian	3	2	2
Native	4	3	4
Hawaiian/PI	-	<1	<1
Other	1	-	-
Multiracial	1	-	-
Gender (%)			
Men	77	93	92
Women	21	7	8
Non-binary	2	-	-
Sexual identity (%)			
Straight	91	-	-
Queer	9	-	-
Parenting status (%)			
Not a parent	50	-	-
Parent to child under 5	37	-	-
Parent of children 6-17	35	-	-
Age at start (Avg)			
Average age	35	30	28
Total apprentices (N)			
Total	231	5888	2886

Demographics of apprentices starting in 2014-2015

<i>Demographic</i>	<i>All trades</i>	<i>Highway trades</i>
Status (%)		
Completed	58	53
Terminated	42	46
Active	1	1
Pre-apprentice (%)		
Completed pre-app	2	4
Program services (%)		
Received services	7	13
Union status (%)		
Union	53	61
Non-union	39	39
Mixed	8	-
Race (%)		
White	79	72
Latinx	12	15
Black	4	6
Asian	2	2
Native	3	4
Hawaiian/PI	-	-
Gender (%)		
Men	94	92
Age at start (Avg)		
Average age	29	28
Total apprentices (N)		
Total	4811	2363

Demographics of apprentices starting in 2020-2021

<i>Demographic</i>	<i>All trades</i>	<i>Highway trades</i>
Status (%)		
Completed	4	<1
Terminated	17	17
Active	77	81
Pre-apprentice (%)		
Completed pre-app	<1	<1
Program services (%)		
Received services	4	8
Union status (%)		
Union	52	63
Non-union	42	37
Mixed	6	
Race (%)		
White	73	69
Latinx	17	19
Black	4	5
Asian	2	5
Native	3	3
Hawaiian/PI	<1	<1
Gender (%)		
Men	91	89
Age at start (Avg)		
Average age	30	28
Total apprentices (N)		
Total	6165	3031

APPENDIX B. Highway Workforce Development Program contracts

Below are the contracts associated with the Highway Workforce Development Program for the 2020-2021 biennium:

Akana (Supportive services for retention of apprentices, pre-apprenticeship)

Baker Technical Institute (Pre-apprenticeship)

Portland State University (Program evaluation)

DHS Office of Self Sufficiency (Childcare subsidies for apprentices)

OHSU (Respectful workplace climate measure)

Oregon State University (Online pre-apprenticeship)

Oregon Tradeswomen (Pre-apprenticeship, respectful workplaces)

Portland YouthBuilders (Pre-apprenticeship)

University of Iowa (Online nutrition training)

APPENDIX C. Fact sheets for industry partners

On the following pages are fact sheets intended for industry partners that summarize key findings for this report. These fact sheets were developed in partnership with the PSU Graphic Design Lab.