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**WASHINGTON STATE FERRIES
WORKFORCE MANAGEMENT ANALYSIS**

FINDINGS REPORT

January 2021

TABLE OF CONTENTS

Executive Summary	4
Introduction	6
<ul style="list-style-type: none"> Legislative Background Research and Data Analysis Approach Data Collection Data Analysis Recommendations 	<ul style="list-style-type: none"> 6 6 7 8 8
Context	9
<ul style="list-style-type: none"> Critical and Complex Nature of the WSF Workforce Current Workforce Description 	<ul style="list-style-type: none"> 9 9
Financial Analysis and Benchmarking	13
<ul style="list-style-type: none"> Regression Model Leave Hours Forecast Expected and Maximum Calculations Deck and Engine Terminal and Eagle Harbor Projected Cost Estimates Peer Systems Vacancies by Job Class and Collective Bargaining Unit 	<ul style="list-style-type: none"> 13 13 13 13 14 14 15 16
Strategies for Filling Vacancies	18
<ul style="list-style-type: none"> Ferry Regulations Current State Mandatory Training and Certification Regulations WSF Current State 	<ul style="list-style-type: none"> 18 19 19 19 20
Barriers to Implementing Workforce Management	21
<ul style="list-style-type: none"> Recruiting and Hiring Processes Leadership Career Support Data and Intent Technology Collective Bargaining Agreements 	<ul style="list-style-type: none"> 21 21 21 21 21
Recommendations	22
<ul style="list-style-type: none"> Workforce Development Model Recruitment Methods and Needs Outreach and Recruitment Strategies for Underrepresented Communities Employee Turnover and Vacancies Overtime and Leave Management Training Budget Adequacy Government and Collective Bargaining Agreements 	<ul style="list-style-type: none"> 22 22 23 24 24 24 25
Acknowledgments	26
Appendix	28

EXECUTIVE SUMMARY

A legislative proviso in ESHB 2322, directed the Consulting & Business Development Center (Center) at the University of Washington's Foster School of Business "to conduct an analysis of workforce development needs of the Washington state ferries."

Between July and December 2020, the Center analyzed 18 data sets provided by Washington State Ferries (WSF), completed a Leadership and Work Experiences Survey of more than 1,500 WSF employees, analyzed payroll data, and benchmarked staffing against the nation's second largest ferry system based on number of passengers. This work provides the Washington State Legislature and WSF with a Workforce Development Readiness Model consisting of four components:

- Who to Hire
- Design of Work
- Workgroup and Supervisory Experiences
- Career Support Satisfaction
- Employee Relationship with WSF

Additionally, this report identifies the need for WSF to initiate a workforce diversity and inclusion strategy to ensure that it has the workforce needed for ongoing success and one that reflects the population of the State of Washington.

Key Recommendations

This report provides specific guidance to WSF management, which, if they are to be successful, will require legislative support.

Recruitment Methods and Needs

- Recommendation to WSF: Create a long-range staffing/talent acquisition strategy
 - To reach this goal, WSF will need budgetary support to launch an integrated technology solution (HRMS, payroll, scheduling, etc.) to implement upgrades to the Talent Acquisition systems currently in place.

Outreach and Recruitment Strategies for Underrepresented Communities

- Recommendation to WSF: Align WSF's diversity, equity and inclusion workforce development strategy with WSDOT strategy
 - To reach this goal, WSF will need legislative support for appropriate staffing to implement their diversity, equity and inclusion plan throughout the WSF organization to include creating relationships with maritime schools and local high school partnerships.

Employee Turnover and Vacancies

- Recommendation to WSF: Improve data collection to better understand the causes of employee turn-over to enable the creation and execution of employee retention strategies.
 - To reach this goal, WSF will need budgetary support to design and deploy an upgraded, integrated technology solution to examine and implement new methods to track real-time vacancies and unwanted turnover.

Overtime and Leave Management

- Recommendation to WSF: Increase the retention rate of permanent FTE deck, engineering, terminal and Eagle Harbor employees to reduce, though not eliminate, overtime expenses
 - To reach this goal, WSF will need ongoing legislative support and inquiry as WSF continues to develop a more cost-effective staffing structure

Training and Budget Adequacy

- Recommendation to WSF: Improve alignment of training courses to safety measures
 - To reach this goal, WSF will need budgetary support for both a technology solution to correlate training and safety outcomes and salary support for WSF employees to complete necessary training programs.

INTRODUCTION

Legislative Background

The Washington State Legislature, through ESHB 2322, directed the Consulting & Business Development Center (Center) at the University of Washington's Foster School of Business "to conduct an analysis of workforce development needs of the Washington state ferries." The legislation specified that this work:

"Should consider the findings from the 2019 Washington state ferries overtime report, including data trend analysis and insight gathered from discussions with Washington state ferries staff and unions.

"The study must include, but is not limited to, the following:

1. A description of the current workforce, including demographic composition, use of relief and temporary employees, and the numbers of management and supervisory staff compared to line workers;
2. An analysis of vacancies by job class and collective bargaining unit, the causes of vacancies, and projections of how these dynamics may change going forward;
3. An analysis of current strategies for filling vacancies, including the use of overtime, relief staff, on-call staff, hiring of additional or new employees, and a comparison of these strategies to determine which may be more cost-effective;
4. An inventory of mandatory training and certification requirements as compared to training provided currently to state ferries employees;
5. An analysis of the role of federal requirements and collective bargaining agreements in determining staffing levels, as well as current practices in workforce management and development;
6. An analysis of barriers to implementing changes in workforce management or innovative approaches to workforce development; and
7. Findings and recommendations regarding recruitment methods and needs, strategies on how to recruit and conduct outreach to underrepresented communities throughout the state, management of overtime and leave usage, ratio of management employees to employees as compared to industry and public sector standards, and adequacy of training budgets to meet workforce development needs."

The Washington State Ferries (WSF) worked with the Washington State Legislature in shaping ESHB 2322 to help advance their career development and workforce diversity strategies.

While not explicit in the legislation, the theme of cost management is implied in items 3, 4, 5, and 7. This report presents a framework and recommendations related to long-term operating cost management.

Research and Data Analysis Approach

Upon receiving the Legislative Directive, the Center determined the research, analytical and industry expertise needed for successful completion of this project. In assembling the team, the Center's emphasis

was on matching the Foster School of Business’ research capabilities with industry and professional expertise to gather and analyze pertinent information regarding current workforce statistics to address the issues in the legislative directive.

Expertise was needed to create, implement and analyze an employee survey which would provide the UW insight into current employee interpretation of the workplace growth and development opportunities, processes, and culture. This expertise would also be needed to gather, review and make recommendation regarding current workforce demographics regarding diversity, recruitment strategies, employee turnover rates.

From the beginning, the Center’s team of 10 faculty, staff, and student assistants met regularly with the WSDOT leadership and management designated as critical point-people for the project. Dozens of interviews have taken place and requests for data have been made. This report encompasses deck, engineering, terminal and Eagle Harbor staff. Biographical summaries of the Center’s team members begin on page 26.

The project was divided into three major segments: data collection, data analysis, and recommendations.

Data Collection

Prior to the project kick-off meeting on July 8, 2020, the Center submitted a data request to the WSF. Additional data requests continued until the end of December 2020. The Center initially requested 18 separate sets of data from WSF. This included information from payroll, Human Resources, Recruiting, Training and Development, and Dispatch. Specific requests were centered around employee historical information, staffing levels, current policies, procedures and practices, organizational charts, and previous employee survey data. These requests led to further requests as the Center began to break down and analyze the immense amount of information.

In September 2020, the Center, in coordination with WSF, launched the “Leadership and Work Experiences Survey” to all deck, engineering, terminal and Eagle Harbor employees. There were two versions of the survey – an employee version targeting non-supervisory staff, and a supervisor version. The surveys covered extensive ground including questions about work motivation, job characteristics, voice-culture, work-group experiences, supervisor leadership style, overall satisfaction and commitment to WSF, career commitment and motivation, reasons for overtime, recruitment and hiring experiences, and training effectiveness. Survey responses were confidential but not anonymous. When completing the survey, employees and supervisors were asked to locate their names on an employee roster and provide a unique survey ID. This survey ID enabled the Center to link their survey responses to individual-level data from HR and dispatch.

Given the constraints of COVID-19 and the unique work conditions of different organizations within WSF, original in-person plans to promote and solicit survey participation were not possible. After much consultation with WSF leadership and with the support of key stakeholders, we ultimately distributed 1,530 surveys (678 deck, 334 engine, 406 terminals, and 112 Eagle Harbor). Online versions of the survey were also available and accessible via a link and QR code. The survey was promoted as a collaboration between WSF and the Center via a flyer, which also stated the objectives of the survey. The survey was promoted via Quick Notice by WSF leadership. Participants were instructed to return their survey responses via a Business Reply Envelope to a UW address, where a member of the Center processed and scanned and inputted the returned surveys. The Center offered \$25 gift cards to 37 randomly selected participants as a token of appreciation for completing the survey. In total, the survey was in active circulation among WSF employees between September 23 and October 20, 2020.

Finally, this report will highlight areas where specific data was not available or inconclusive and include recommendations for future data analysis that will contribute to future rounds of workforce

development strategies.

Data Analysis

The Center began comparing the data from the various sources, to ensure we had all the correct information. Given the different technology systems that WSF and WSDOT use to manage employees and operations, the Center along with WSF identified, corrected, and validated data where there were inconsistencies in data from WSF's dispatch and Human Resource Management System (HRMS).

In total, 249 employees responded to the Leadership and Work Experience Survey employee version of the survey, and 108 supervisors responded to the supervisor version of the survey. The breakdown of the responses by organization are presented below.

Table 1: Employee and Supervisor survey responses by organization

	EMPLOYEES		SUPERVISORS	
	Frequency	Percentage	Frequency	Percentage
Deck	72	30.4%	46	45.5%
Engine	28	11.8%	21	20.8%
Terminal	107	45.1%	15	14.9%
Eagle Harbor	30	12.7%	19	18.8%

When comparing the percentage of total survey responses from a particular organizational group to the percentage of total active employees from those same groups, we can see that Eagle Harbor and terminals had slightly higher representation in the survey responses, while deck and engine had slightly lower representation in the survey responses. Generally, however, the survey responses were representative of those respective groups. A comprehensive breakdown of the survey responses appears in *Volume II: Survey Data Report, Leadership and Work Experiences*.

Recommendations

The Center recognized that recommendations on workforce development strategy needs to be tied into the broader organizational strategy and informed by available and expected resources within the context of the collective bargaining agreements to execute on strategy recommendations. As such, the recommendations that were proposed by the Center, were reviewed, modified and accepted by WSF leadership.

CONTEXT

Critical and Complex Nature of the WSF Workforce

As reported in the Overtime Analysis Findings Report of January 2020:

“The U.S. Coast Guard sets minimum staffing levels which must be met for the vessel to carry passengers. Engine room crews are aboard the vessel 24 hours a day (and work an 84 hour week) to support the service schedule and ensure vessels are in good operating condition. Routes and many vessels are unique, and crew must complete familiarization with the vessel and route. Maintenance facility must support vessels and terminals 24 hours a day every day but is staffed with a single eight-hour shift. Additionally, each department has its own contractual requirements governing employee management practices, such as how seasonal and short-term shifts are assigned, and vacations scheduled”

According to the U.S. Department of Transportation, Bureau of Transportation Statistics, 2016 National Census of Ferry Operators, WSF had the largest number of vehicles boarding count and second largest number of passenger boarding count in the country. The WSF system operates 10 ferry routes in Puget Sound with more than 1,500 operational employees in the deck, engineering, terminal and Eagle Harbor. There are more than 60 different employee classifications or designations. There are eight separate collective bargaining agreements. Each of these factors, in and of themselves are found in many organizations. However, when all are within one vast organization, and when staff movement of any kind is considered, there are a tremendous amount of complexities presented in a multi-dimensional matrix of decision making.

Current Workforce Description

According to the WSF 2019 Overtime Analysis Findings Report, 9% of current employees are eligible to retire in the next year and 30% in the next five years.

Ethnicity is gathered on a voluntary basis upon employment. We see no evidence that a system-wide effort has ever been conducted to gather comprehensive ethnicity information. The WSF system does not produce or participate in the EEOC-1 Report as an independent entity as this data is combined under the WSDOT report. This combined reporting prevents us from analyzing the current demographic makeup of the WSF workforce. Additionally, this combined reporting hinders the ability of WSF leadership from making on-going assessments of the effectiveness of their workforce inclusion strategies.

The Center found no evidence of specific WSF strategies currently employed to identify, attract and retain a staff demographic that is representative of Washington State. We understand that WSDOT put forth an aggregate report in November 2020 which identifies the need to implement a comprehensive diversity, equity and inclusion strategy.

For this report, we will define the terminology of diversity, equity, and inclusion. Diversity has been defined as “the representation, in one social system, of people with distinctly different group affiliations of cultural significance” (Cox T. *Cultural diversity in organizations: Theory, research and practice*. 1993: San Francisco; Berrett-Koehler, p. 5). Inclusion differs from diversity in focusing not only on the compositional mix

of people, but also on every employee's incorporation into organizational processes and culture. Inclusion is "the degree to which individuals feel a part of critical organizational processes such as access to information and resources, involvement in work groups, and ability to influence the decision-making process" (*Mor-Barak ME, Cherin DA. A tool to expand organizational understanding of workforce diversity: Exploring a measure of inclusion-exclusion. Administration in Social Work. 1998; 22; 1: 47-64, p. 48*). Finally, equity, refers to "the absence of systematic disparities ... between groups with different levels of underlying social advantage/disadvantage—that is, wealth, power, or prestige" (*Chin MH, Chien AT. Reducing racial and ethnic disparities in health care: An integral part of quality improvement scholarship. Quality and Safety in Health Care. 2006; 15: 79-80, p. 79*). Equity differentiates from inclusion in that it places the outcome at the system or organizational rather than the group or individual level. Equity calls for the righting of systemic and structural injustices.

In the article, *Why is Diversity & Inclusion in the Workplace Important?* (*Bush, Great Place Work, November 20, 2020*), the author describes studies that show the benefits of a diverse and inclusive workplace. They include:

Greater readiness to innovate – "Regardless of industry, field, or domain, the organizations that seek diverse viewpoints—across ethnicity, gender, age, educational background, etc.—experience higher rates of innovation. (*Why Diverse and Inclusive Teams Are the Engines of Innovation, Johansson, Great Place To Work, June 11, 2020*).

Diverse and Inclusive teams not only provide more unlikely and creative ideas, but also have shown to perform better at making decisions. Data collected by Cloverpop on its decision management platform found that the more diverse the team the better the decision that team made. This notion is also supported in *The Wisdom of Crowds* by *James Surowiecki*. Diversity has shown to increase the ambition level of teams for achieving stretch goals and redefines parameters that otherwise operate within homogeneous teams. Furthermore, diverse teams have more pathways to execute ideas, which increases efficiency and is more cost-effective.

Increased ability to recruit a diverse talent pool – Diverse teams provide networks and cultural perspective that may not have otherwise been explored on their own. This provides greater resources and drives fast action, especially for organizations with limited budgets.

Higher employee retention – Most importantly as related to this report, inclusion in the workplace is one of the most important keys to retention. Studies showed that "when employees trust that they, and their colleagues, will be treated fairly regardless of race, gender, sexual orientation or age, they are:

- 9.8 times more likely to look forward to going to work
- 6.3 times more likely to have pride in their work
- 5.4 times more likely to want to stay a long time at their company"

An inclusive workplace culture will help attract a diverse set of talent and retain valuable employees within the organization.

Increasing inclusion is a big topic in today's organizations. And WSF is no exception. Generally speaking, when employees feel safe to be themselves and are appreciated for their unique attributes, they experience higher inclusion; in contrast, when employees don't feel like they can be themselves and must hide or mask core parts of themselves because they feel unsure, unsafe, or invisible, they experience lower inclusion. Several actions can be taken to increase inclusion. Based on data provided us by WSF human resources and dispatch in August 2020, the current staffing breakdown is:

Table 2: Selected WSF Employee Data (Gender, Ethnicity, Age)

Gender	Count	Percent	Washington State Population ¹
Male	1,244	76.4%	49.8%
Female	341	20.9%	50.2%
Chose Not to Respond	44	2.7%	
Total	1,629	100%	
Race and Ethnicity	Count	Percent	Washington State Population ¹
White/Caucasian	795	48.8%	77.3%
American Indian or Alaska Native	26	1.6%	1.5%
Asian American	40	2.5%	7.2%
Black or African American	23	1.4%	3.6%
Native Hawaiian or Other Pacific Islander	5	0.3%	0.6%
Some Other Race	Data Not Available	Data Not Available	4.7%
Two or More Races	1	0.1%	4.7%
Hispanic/Latino	Data Not Available	Data Not Available	11.2%
Chose Not to Respond	739	45.4%	
Total	1,629	100%	100%
Age Group	Count	Percent	Washington State Population ¹
18-20	44	2.7%	6.9% ²
20-29	152	9.3%	14.0%
30-39	284	17.4%	13.4%
40-49	310	19%	14.2%
50-59	447	27.4%	14.1%
60-69	364	22.3%	9.7%
70-79	26	1.6%	4.9%
80-89	2	0.1%	3.4% ³
Total	1,629	100%	80.6%⁴

¹OFM Data Book 2019

²OFM Data Book includes 15-19 year-olds in this category

³OFM Data Book includes all Washingtonians over the age of 85 in this category

⁴Does not total 100% as data for Washingtonians under the age of 18 are not included

Table 3: Selected WSF Employee Data (Tenure, Employee Status, Organizational Group)

Years of Service	Count	Percent
0-5	524	32.2%
6-10	289	17.7%
11-15	228	14%
16-20	124	7.6%
21-25	194	11.9%
26-30	121	7.4%
31-35	50	3.1%
36-40	30	1.8%
41+	25	1.5%
Data Missing	44	2.7%
Total	1,629	100%
Employee Status	Count	Percent
Non-Permanent	451	27.7%
Permanent	1,178	72.3%
Total	1,629	100%
Organizational Group	Count	Percent
Deck	712	43.7%
Engine	440	27%
Terminal	367	22.5%
Eagle Harbor	110	6.8%
Total	1,629	100%

Table 4: Supervisor and Non-Supervisor Ratios

		Non-Supervisor	Supervisor	Total
Deck	Count	551	161	712
	Percent	77.4%	22.6%	100%
Engine	Count	330	110	440
	Percent	75.0%	25.0%	100%
Terminal	Count	332	35	367
	Percent	90.5%	9.5%	100.0%
Eagle Harbor	Count	81	29	110
	Percent	73.6%	26.4%	100%
Total	Count	1,294	335	1,629
	Percent	79.4%	20.6%	100%

FINANCIAL ANALYSIS AND BENCHMARKING

The results of the Center's financial model compares the difference between the payroll costs for filling vacancies entirely with straight-time hours or entirely with regular overtime hours. Based on this cost analysis, the Center recommends that WSF develop a strategy to minimize the costs to fill vacancies due to leave usage to the level at which WSF would pay if the vacancy is filled using entirely straight-time hours. We suggest that WSF fill vacant positions with the lowest cost employee with the least amount of work hours accrued, subject to the requirements of the employee's Collective Bargaining Agreement. This will allow WSF to determine the optimal number of hours needed that would minimize the use of overtime usage due to exceeding 80 hours in a work period or working a job not scheduled.

Regression Model

Using the leave data from 2017-2020 provided by the WSF, the Center conducted a linear regression analysis using R to calculate predicted leave hours per each instance of leave usage for each employment position. This regression analysis was conducted for both paid time-off (PTO) and leave without pay (LWOP). Furthermore, the Center calculated a simple average, minimum, and maximum of average predicted leave hours per position. We organized the predicted leave hours by quarter to capture the variance in hours for different seasons. This analysis was conducted for each year from 2017-2020.

Leave Hours Forecast

Using PTO and LWOP data from 2017-2019 (Center omitted 2020 in this analysis due to it being an anomaly due to the impact of COVID-19 compared to the more normal historical years), the Center forecasted total expected leave hours per position for each quarter of 2021 by projecting the average historical change in leave hours over the three year historical period to the forecast period. This analysis was conducted for both PTO and LWOP with the an average of their results representing the combined expected leave hours per position.

Expected and Maximum Calculations

The definitions for the terms used for the table in this section are:

- Expected ST – Taking the average costs for staff paid at the straight-time rate in the 2017-19 period the Center projected an expected straight-time cost for 2021
- Maximum ST – Taking the highest cost for staff paid at the standard rate during the 2017-19 period, the Center projected the maximum straight-time cost for 2021
- Expected OT - Taking the average costs for staff paid at the overtime time rate in the 2017-19 period the Center projected an expected overtime time cost for 2021
- Maximum ST – Taking the highest cost for staff paid at the overtime rate during the 2017-19 period, the Center projected the maximum overtime cost for 2021

Deck and Engine

The Center analyzed deck and engine payroll costs by analyzing each vessel and their staffing requirements. Given any vessel position vacancies, the Center estimated the costs to fill those vacancies according to the expected hours of leave for that position on the vessel. Then, the Center calculated an expected and maximum range of payroll costs based on the average expected leave hours and maximum expected leave hours calculated from the regression model and if the hours for the vacant positions were filled either entirely by straight-time hours or regular overtime hours at 1½ times the straight-time hourly pay rate. The financial model by default

assumes that each position for each vessel is vacant (the number of vacancies per vessel position can be adjusted to represent actual manning needs) to demonstrate the highest costs that WSF could incur.

Terminal and Eagle Harbor

The Center analyzed the payroll costs of filling vacancies for each terminal and Eagle Harbor position using a similar methodology to that for the deck and engine vessel manning positions. The difference between the two methodologies is that the Center based payroll costs on the number of instances of leave usage per position per quarter in 2019. Then, the Center calculated an expected and maximum range of payroll costs if the hours for the vacant positions were filled either entirely by straight-time hours or regular overtime hours at 1½ times the straight-time hourly pay rate.

Projected Cost Estimates

Deck & Engine – After careful analysis of the leave and pay data provided by the WSF, we estimated a range of costs dependent on how vacant deck and engine positions are filled upon need due to leave usage. The results summarize a projected range of costs under the scenarios of filling all vacancies at the straight-time hourly pay rate or filling all vacancies at the overtime pay rate per quarter. The expected cost values are based on the past patterns of leave across deck and engine employees from the years 2017-2019.

Table 5: Projected Cost Estimates Deck & Engine

	Expected ST	Max ST	Expected OT	Max OT
Q1	\$223,680.84	\$365,234.06	\$335,521.27	\$547,851.09
Q2	\$246,883.35	\$360,817.68	\$370,325.02	\$541,226.51
Q3	\$242,502.20	\$353,603.93	\$363,753.30	\$530,405.89
Q4	\$226,700.72	\$350,374.08	\$340,051.07	\$525,561.11
Total Year	\$939,767.11	\$1,430,029.74	\$1,409,650.66	\$2,145,044.60

In this analysis, WSF would be indifferent between paying \$1.4 million in staff overtime or in staff straight-time. Given that overtime is calculated at time-and-a-half, WSF can spend an approximate \$930,000 in straight-time pay to cover the same number of hours that the \$1.4 million in overtime pay covers. Another way to view this is that by spending an additional \$930,000 to hire straight-time staff will save WSF approximately \$460,000. The one caveat in this calculation is the assumption that all of the overtime work can be covered by straight-time work which, given the seasonality of operations, may not be possible.

Terminal – After careful analysis of the leave and pay data provided by WSF, the Center estimated a range of costs dependent on how vacant terminal positions are filled upon need due to leave usage. The results summarize a projected range of costs under the scenarios of filling all vacancies at the straight-time hourly pay rate or filling all vacancies at the overtime hourly pay rate per quarter. The expected cost values are based on the past patterns of leave across terminal employees from the years 2017-2019.

Table 6: Projected Cost Estimates Terminal

	Expected ST	Max ST	Expected OT	Max OT
Q1	\$2,110.93	\$11,043.00	\$3,166.40	\$16,564.51
Q2	\$800.39	\$3,627.07	\$1,200.58	\$5,440.60
Q3	\$2,190.07	\$5,416.04	\$3,285.11	\$8,124.07
Q4	\$1,142.14	\$3,550.62	\$1,713.21	\$5,325.93
Total Year	\$6,243.53	\$23,636.73	\$9,365.29	\$35,455.10

The potential cost savings of \$26,000 is so small compared with potential savings in other areas, that the Center considers this an unimportant area in which to dedicate WSF staff time to address.

Eagle Harbor – After careful analysis of the leave and pay data provided by WSF, we estimated a range of costs dependent on how vacant Eagle Harbor positions are filled upon need due to leave usage. The results summarize a projected range of costs under the scenarios of filling all vacancies at the straight-time hourly pay rate or filling all vacancies at the overtime hourly pay rate per quarter. The expected cost values are based on the past patterns of leave across Eagle Harbor employees from the years 2017-2019.

Table 7: Projected Cost Estimates Eagle Harbor

	Expected ST	Max ST	Expected OT	Max OT
Q1	\$544,084.63	\$818,534.64	\$816,126.94	\$1,227,801.96
Q2	\$305,394.73	\$418,175.09	\$458,092.10	\$627,262.64
Q3	\$409,291.22	\$560,114.96	\$613,936.84	\$840,172.44
Q4	\$426,228.11	\$579,314.14	\$639,342.17	\$868,971.21
Total Year	\$1,684,998.69	\$2,376,138.83	\$2,527,498.04	\$3,564,208.25

In this analysis, WSF would be indifferent between paying \$2.5 million in staff overtime or in staff straight time. Given that overtime is calculated at time-and-a-half, if WSF were to spend an approximate \$1.67 million in straight-time pay to cover the same number of hours that the \$2.52 million in overtime pay covers. Another way to view this is that by spending an additional \$1.67 million to hire straight-time staff will save WSF approximately \$825,000. The one caveat in this calculation is the assumption that all of the overtime work can be covered by straight-time work which, given the seasonality of operations, may not be possible.

Peer Systems

In comparison with the WSF’s closest peer system, based on ridership volume according to the *U.S. Department of Transportation, Bureau of Transportation Statistics, 2016 National Census of Ferry Operators*, the NYC Ferry had the highest passenger boarding count at more than 43.5 million passengers in 2016, which is 40% higher than the passenger boarding count for WSF in 2016. Although New York’s passenger boarding count is larger, NYC Ferry is managed by the private operator Hornblower Cruises and Events. This is unlike WSF, which is managed by the Washington State Department of Transportation.

That said, according to a comprehensive *Citywide Ferry Study (CFS2011)* completed by the *New York City Economic Development Corporation in 2013*, the following includes estimates in operating and labor costs for ferry transportation throughout New York City. This cost model includes only those costs directly associated with vessel operations; it does not include ancillary costs such as shuttle buses, terminal agents, or landing fees. These costs are calculated separately for inclusion in the overall system cost model.

Table 8: Projected NYC Ferry Hourly Operating Costs per Vessel Type

Type	Description	Fuel	Labor	Machinery & Hull Maintenance	Lease Cost	Admin / Insurance / Overhead	Total Hourly Cost
A	Small Monohull	\$176	\$56	\$34	\$42	\$80	\$388
B	Large Monohull	\$112	\$123	\$34	\$59	\$81	\$408
C	Small Catamaran	\$118	\$56	\$26	\$26	\$60	\$295
D	Medium Catamaran (Slow)	\$136	\$116	\$34	\$34	\$86	\$423
E	Medium Catamaran (Medium)	\$239	\$116	\$44	\$44	\$120	\$570
F	Medium Catamaran (Fast)	\$298	\$116	\$50	\$50	\$139	\$654
G	Large Catamaran	\$935	\$183	\$129	\$129	\$374	\$1711

Citywide Ferry Study (CFS2011), New York City Economic Development Corporation in 2013

Aside from fuel cost, labor accounts for the highest cost category for NYC Ferry. On average, they project an hourly employee rate of \$109 across all their vessel types.

In comparison to WSF's projected hourly labor through our financial model, Eagle Harbor (which accounts for the highest projected labor costs segments for WSF) has an hourly employee range from \$34.43/hour (hourly rate exclusive to straight-time pay) to \$51.64/hour (hourly rate including overtime). These amounts are significantly less than those in NYC Ferry. There are varying factors that influence these values such as local rates/regional economy, private versus public ferry operators, labor union agreements, state regulations, etc. WSF has lower projected average hourly labor costs compared to their closest peer system. At the time of completion of this report, we are unaware of an industry standard or target for appropriate overtime. However because the WSDOT 2020 Overtime report was issued, we found that more scrutiny has been placed on minimizing overtime usage.

Vacancies by Job Class and Collective Bargaining Unit

Internal lateral or promotional openings are almost solely filled from within the WSF ranks. This occurs for any position that opens for full time, permanent positions. These positions are filled through a process defined in collective bargaining agreements (CBAs) which stipulate that open positions are first filled by (a) qualified individuals with contract seniority then (b) through a bidding process, and (c) then by relief staff. The bidding process involves offering the open positions to seniority staff. If that person does not want to take the position, the position is open to others with seniority to bid for the for the opening.

Due to COVID-19 environment, the Center was unable to ascertain specific point-in-time vacancies as there has been a hiring freeze since Spring of 2020. The Center was unable to ascertain historical data regarding open positions year over year—when they occurred, what positions, or reasons for the turnover due to lack of data. It appears that this data is not kept by WSF. In the context of workforce management plan, the historical data is actually more helpful to project vacancies, and address workforce movement.

Although nothing in the survey data speaks to the number of vacancies or the causes of vacancies, the employee survey did capture turnover intentions among certain groups (work area, job class, demographic group), which might provide some helpful information in forecasting vacancies in the near future. This information can be found in *Volume II: Survey Data Report, Leadership and Work Experiences*. Unwanted turnover in any industry is a direct cost to the bottom line of the organization. It can affect morale and a constructive culture. It

is approximated that for each individual leaving an organization, the direct cost of that termination is one-third to 45% the annual salary of that employee (*SHRM, 2017*).

Employee turnover and employee retention are inextricably connected. The table below is an analysis of WSF Turnover for 2017, 2018, and 2019 within the first year of employment. Presumably all these employees went through an extensive amount of training upon hire. Without further information, it is difficult to address retention strategies. Resignation is a voluntary termination by the employee, as End of Appointment is involuntary.

Table 9: Turnover Reasons Within First 12-Months of Employment 2017-19

Oiler	Resignation	End of Appointment
2017	0	0
2018	1	1
2019	3	2
2020	1	0
Total	5	3
On Call Deck	Resignation	End of Appointment
2017	12	3
2018	7	11
2019	8	3
2020	6	9
Total	33	17
Ordinary Seaman	Resignation	End of Appointment
2017	1	3
2018	2	1
2019	2	0
2020	0	0
Total	5	4
On Call Terminal	Resignation	End of Appointment
2017	4	7
2018	6	16
2019	8	7
2020	5	0
Total	23	30
Electrician	Resignation	End of Appointment
2017	1	0
2018	0	0
2019	0	0
2020	0	0
Total	1	0

STRATEGIES FOR FILLING VACANCIES

The practice for hiring employees in the maritime industry is based on the numbers and types of crew members required. For example, a company that operates small passenger vessels need only hire 1-3 licensed personnel per vessel. Those segments of the industry tend to be insular and hire within well-known ranks of seasoned mariners, who typically hold lower-level officer licenses, or entry level Merchant Mariner Certificate (MMC) with minimal endorsements.

However, organizations with vessels that operate either internationally or larger in tonnage need to draw from an ever-decreasing pool of professional mariners⁵ for their officers, and a shrinking pool of laborers that could attain a Transportation Workers Identification Card (TWIC) and USCG required medical certificate for their ratings⁶. The median age of merchant mariners is 46 and rising⁷, while the US median age is 38.2 years⁸ and the median age in Washington State is 38.3⁹. This median age differential suggests that new credentialed sailors are not joining the Merchant Marines in sufficient numbers to offset retirements and resignations.

Ferry Regulations

Each ferry in the WSF fleet has a Certificate of Inspection (COI) and associated Manning Certificate which dictate the minimal number of mariners required to operate the vessel safely. The United States Coast Guard (USCG) determines the number of personnel required to operate the vessel safely, based on a number of things, but essentially 46 CFR Part 15 provides guidance to the local USCG Officer In Charge Marine Inspections (OCMI). Note that mariners holding a superior endorsement may sail in all capacities that are inferior to their endorsement (subject to propulsion mode limitations). For example, a Second Assistant Engineer of Motor Vessels may also sail as a Third Assistant Engineer on a motor vessel, and a Chief Mate may sail as Second Mate or Third Mate.

Traditionally at WSF, each Fall there is a mass hiring effort to identify 40-65 relief able-bodied seaman for deck, and entry level oilers for engineering. There are about 30 sources for recruiting, including job fairs, web sites and NEO-Gov postings. It takes several months to complete reviewing applications, (approximately 400) screening applicants, hiring events and panel interviews. All applicants go through this lengthy process regardless of their training, schooling or licensure.

In determining the effectiveness of WSF's recruiting process, we sought information on three areas:

- Locations such as colleges, vocational schools, training programs, and conferences where recruiting occurs
- Outlets where job openings are posted, such as recruiting websites or industry publications
- Data analyzing recruiting methods, including:
 - Cost per effort, or cost per successful applicant
 - Efforts that generate the highest number of applicants
 - Efforts that hire the highest number of applicants
 - Tracking data that correlate efforts with successful applicant hiring, promotion and retention
- WSF has a list of locations and outlets for recruiting but does not track the cost or effectiveness of recruiting efforts (See Appendix for list of recruiting resources).

⁵Grady, J. (2020, November 26). U.S. Facing Looming Shortage of Merchant Mariners. Retrieved from <https://www.maritime.edu/news/us-facing-looming-shortage-merchant-mariners>

⁶Clark, B., Walton, T., Lemon, A. (2020, February 12) Strengthening the U.S. Defense Maritime Industrial Base: A Plan to Improve Maritime Industry's Contribution to National Security, pg. 26

⁷Ibid., pg. 26

⁸US Census Bureau, 2018 Population Estimates

⁹Washington State Office of Financial Management <https://www.ofm.wa.gov/washington-data-research/statewide-data/washington-trends/population-changes/population-age-mapped-county>

Current State

The number of hires is determined by WSF operations leadership and is broadly based on the previous year's numbers. There is no specific data or strategy for targeted hiring. Each year in November up to 10 terminal employees based on seniority are eligible to bid for the open deck or engineering positions with an internal employee transfer. As of December 2020, we found that Chapter 10 in the WSDOT human resources manual has been updated to reflect a process that tightens up the annual mass hiring, shortens the time and suggests a year round process. We support this updated process for WSF to the extent that it creates a better experience for the candidates and is more streamlined for the hiring teams.

The Leadership and Work Experience Survey of 1,530 WSF staff suggest that only three sources (of the 30 listed) are the consistent sources for applicants: word of mouth from friends and family, on-line postings and employee referrals. Historically the information regarding sourcing has not been kept. The Center found no evidence of specific WSF strategies currently employed to identify, attract and retain needed talent, or a staff demographic that is representational of the communities in which they work.

Mandatory Training and Certification

According to the *WSF Overtime Analysis Findings Report*, earning a master's license requires years of training and testing, and preparation, including 16 roundtrips on each of the WSF's 10 routes and successfully drawing pilotage maps during testing. Most of the required work must be accomplished on an employee's own time.

The WSF fleet operates 21 ferries that operate in the domestic and international waters of Puget Sound and the Salish Sea¹⁰. Each vessel has a distinct United States Coast Guard (USCG) issued Certificate of Inspection (COI) document that dictates staffing requirements for that vessel. Also, large U.S. flag passenger vessels have training requirements that can be found in the Code of Federal Regulations (CFR), specifically 46 CFR Subchapter H, § 78.17-50, which refers to 46 CFR Subchapter W, § 199.180 Training and drills.

The USCG has training and continuing education requirements for various MMC endorsements, and these vary greatly by department including engineering, deck, and steward, endorsements on MMC such as Ratings and Officers, and size of vessel and routes for which the mariner is endorsed such as Unlimited Master on Inland Waters, Chief Engineer of Steam/Motor /Gas Turbine, among others.

Regulations

For vessels that are operating on domestic routes only, USCG National MMCs are required for both ratings and officer positions. For vessels that are operating on international routes, mariners are required to meet both national and international regulations, of which the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 Convention, amended in 1995 and 2010 (STCW) contains the overarching regulatory requirements.

There are many STCW required training and assessments, but they are associated with an endorsement on an individual's MMC. For example, in order to receive an international endorsement as an Officer in Charge of a Navigation Watch (OICNW) on an unlimited tonnage vessel, (Washington State ferries are all unlimited tonnage) a mariner must, in addition to license testing requirements, have also taken courses like Basic Safety Training, Medical First Aid Provider, Search and Rescue, Bridge Resource Management, Meteorology, etc¹¹. The total outlay of training and assessments for a mariner with an international endorsement can cost the mariner

¹⁰Retrieved 11/24/2020 from <https://wsdot.wa.gov/ferries/about-us>

¹¹https://www.dco.uscg.mil/Portals/9/NMC/pdfs/checklists/mcp_fm_nmc5_204_web.pdf

upwards of \$15,000, as a conservative estimate. However, a similarly licensed watch officer on domestic routes is not required to take any STCW training.

WSF Current State

Because the WSF operates in international waters for the Anacortes to Sydney, BC route, the presumption is that their mariners are required to maintain international endorsements and compliance with STCW on their MMC. However, the WSF operates under an alternate compliance agreement with the USCG, so Washington State Ferry mariners with national endorsements may sail on the international run to Sydney B.C. without having current STCW qualifications¹². While not required for employment, STCW international endorsements are considered as an additional qualification during the hiring process.

Despite this alternate compliance agreement, the WSF has developed, maintains and conducts in-house USCG approved STCW compliant courses, and requires all deck, engineering and steward department new hires take them during orientation. This in-house training requirement also exists for new hires that already have taken those STCW courses elsewhere and have those endorsements on their MMC. Currently the cost of training new hires in basic on-boarding sessions is between \$12K - \$15K per employee.

Nothing in the Leadership and Work Experience Survey speaks to mandatory and certification requirements. However, the survey does provide an estimation of how frequently employees attended mandatory versus voluntary trainings. It also inquired into the barriers to attending voluntary trainings, which might yield some qualitative insights for how to make voluntary training more accessible to all. Lastly, it provided perceived training effectiveness, broken down by group.

Based on the information provided, it appears that WSF does not currently have a leadership development program for supervisors. One key finding from the Leadership and Work Experience Survey indicates that barriers to workforce development reveals that leadership – in particular, empowering leadership, leader-member exchange, and supervisor career support – played an important role workforce development and enhancing employees' career commitment, motivation, and efficacy. The survey indicates that the average supervisor believes they are more empowering than the average employee perceives they are. The WSDOT professionals dedicated to workforce development for WSF feel hamstrung by lack of financial support, and recognition that the development of WSF crew is crucial to the future viability of the ferry system. They have a full arsenal of superior modeling for learning center platforms, and good structural template which address learning at all levels, however are unable to execute a full launch without the ability to make strategic moves that are needed to operationalize.

¹²As per 10/09/2020 email: From: Crawford, Jane <crawfoja@wsdot.wa.gov> Sent: Friday, October 9, 2020 5:27 PM To: tpritch <tpritch@uw.edu> Subject: FW: [EXTERNAL] Training Information Details Request, Attachment Answers UW Workforce Development Questions - Follow Up 10-23-2020.dot. It is unclear as to who provided the answers in the document.

BARRIERS TO IMPLEMENTING WORKFORCE MANAGEMENT

Throughout our research, specific themes rise to surface as significant limitations to implementing a workforce management.

Recruiting and Hiring Processes

The WSDOT Talent Acquisition team has recognized the need to update the traditional mass hiring in the late Fall every year for WSF. As mentioned above, the WSDOT team added (December 2020) a comprehensive recruiting process and procedural section to its HR manual. This outlines the purpose of the processes, and includes steps to consider surrounding diversity and inclusion awareness, using appropriate interview questions, internal approval, roles and responsibilities, make-up and characteristics of interview panels, and salary settings. The process is very detailed and is written to ensure compliance with all RCWs and lowers risk exposure.

Leadership Career Support

Regarding the Leadership and Work Experience Survey and empowering leadership as mentioned on page 20, the finding points to the lack of crucial leadership training among supervisors, and specific skill development to support staff in their career development endeavors. This also points to a need for leadership training among supervisors, and specific skill development to help staff in their career development endeavors. (*See Volume II: Survey Data Report, Leadership and Work Experiences*)

Data and Intent

The ability to be strategic about developing and implanting a workforce management culture at WSF has been hampered by the lack of historical focus or intent. A Workforce Management program will need to be developed from the ground-up with little current infrastructure to build upon. The WSDOT long range plan speaks to the need for workforce management, but it has not been introduced to WSF.

Technology

Through this project, the Center encountered great difficulty regarding HR/employee technology platforms. There are multiple disparate platforms used throughout the employee lifecycle. HRMS (SAP), ECM Portal/ILINX, NeoGov and AOSS are all used to collect and house different employee data. These systems do not all integrate as a robust, effective strategic system should. We heard directly from WSF staff and leadership about the frustration in using these non-integrated systems and the challenges in extracting data that would allow for better strategic decision-making.

Collective Bargaining Agreements

It is a fact of life that WSF operations are bound by the negotiated collective bargaining agreements. With eight different bargaining units, employee movement is cumbersome and challenging. Engaging the bargaining units in the creation of a workforce management system is essential and crucial for its success.

Traditionally, CBAs are in place to protect employee rights, guarantee regular salary increases and assure a rich benefits structure. While this has always been recognized as important for employee sense of secure, long-term employment, the CBA environment does not reward employees for extra effort, career intrinsic motivations, which are crucial elements to workforce management culture.

RECOMMENDATIONS

Workforce Development Model



Recruitment Methods and Needs

To fulfill the goals below, the Center recommends the Washington State Legislature fully supports WSF in the staff and integrated technological needs to implement upgrades to the Talent Acquisition systems currently in place. Specific recommendations for operationalizing are below:

- Create a long-range staffing/talent acquisition strategy specific to WSF
 - Utilize historical data to determine effective recruiting sources
 - Create targeted outreach strategies for under-represented populations and target specific job classifications
 - To ensure the ability of meeting long-range staffing needs engage with high school and pre-high school populations to stimulate career interest
 - Create a robust outreach strategy with local maritime schools
- Adjust the recruiting and hiring process
 - Move from the once yearly mass hiring exercise and create a sustainable year-round program.
 - Begin measuring the success of hiring efforts
 - Within the HRIS track recruitment and hiring costs, the quality of the hires given specific actions and efforts. The information may enable to reduce costs
 - Align screening and interviewing process to reduce excess hiring to reduce resignation rates that occur within first 12 months of employment

- Shift the entry level officer recruitment calendar to late winter for mid-summer new-hire orientation sessions. The April start date hampers the hiring of entry level officers, the majority of whom will not be licensed by the USCG until after the end of their respective maritime academy spring term, which is typically in June.
- When hiring for officer positions, concentrate on locations that specialize in maritime-specific vocation. There are seven (7) maritime academies¹³ that graduate officers with deck and engineering MMCs that meet WSF staffing level requirements for entry-level officer positions.
- The length of time between a November recruiting event and the new-hire orientation in April is five months. This seems to be an excessive length of time, unless the recruitment is only for entry level officers that are awaiting licensure. To avoid losing experienced and qualified mariners to other employers, shorten the length of time between recruitment efforts for experienced mariners and their new-hire orientation to 1-2 months.
- Recruitment for licensed officers is currently taking place at engineering-specific recruitment events or at 4-year universities. The engineering programs at the state's four-year universities do not have specific tracks for the maritime industry as do specialized schools such as the California Maritime Academy Marine Engineering Technology major, which prepares students to become a licensed Third Assistant Engineer.
- Reduce turn-over to reduce recruitment needs
 - The satisfaction levels of WSF employees matters for their career commitment, motivation, and efficacy which influences retention rates. Increasing retention rates will reduce the need for and cost of recruiting, hiring, and onboarding new staff.
 - Ensure that there is clear information on career advancement for employees in different occupational paths.
 - Information should not only chart out the path to advancement, but also the technical, social, and other competencies that are needed to advance, and where/how those competencies can be acquired.
 - Ensure that opportunities to access developmental assignments and experiences are available and equitably distributed
 - Align and communicate individual job performance to organizational mission
 - Help people fit in
 - Create positive, shared experiences among employees, as doing so reinforces a feeling of belonging and fitting in. Personal meetings as well as company-wide events can accomplish this. Involving employees in company-wide decisions also accomplishes this.

Outreach and Recruitment Strategies for Underrepresented Communities

Given Governor Jay Inslee's historic 2021 commitment to diversity, equity and inclusion, and particularly to support career development, the Center recommends that the Washington State Legislature supports WSDOT in implanting their diversity, equity and inclusion plan throughout the WSF organization to include creating relationships with maritime schools and local high school partnerships.

- Improve existing data on current employees to more accurately understand employee demographics
- Align WSF's diversity, equity and inclusion workforce development strategy with WSDOT strategy
- Identify specific communities of under-served positions and begin a strategic outreach, advertising and engagement

¹³U.S. Department of Transportation, Maritime Administration (2020, November 26) Maritime Academies. Retrieved from <https://maritime.dot.gov/education/maritime-academies/maritime-academies>

- Hire a more diverse workforce, with particular attention to a diverse leadership team
- Strengthen anti-discriminatory policies, particularly with respect to hiring and promotions, as well as ensuring that people feel like they can bring their whole selves to the workspace they occupy.

Employee Turnover and Vacancies

The Center recommends that the Washington State Legislature fully supports WSF to upgraded its integrated technologies to examine and implement new methods to track real-time vacancies and unwanted turnover.

- Create a data base to capture turnover statistics
 - This should include all employee demographic information, including age, ethnicity, years of service, position codes, departments, etc.
 - Upgrade and utilize reason codes to include specific causes of turnover for both voluntary and involuntary reasons
- Examine turnover data on a regular basis, to proactively create retention and outreach strategies
- Increase transparency regarding internal opportunities
- Create a stronger exit interview process
 - Capture pertinent information, using in-person and on-line exit survey on a consistent basis
- Track year-over-year vacancies to analyze trends that enable strategic decisions in recruiting, hiring, and workforce development

Overtime and Leave Management

In late 2019, and 2020, WSF conducted an extensive audit of overtime usage. The Center also conducted its own analysis of leave usage. As a result of both of these audits, the Center recommends that the Legislature further supports examination of overtime usage through increased ongoing scrutiny from internal financial analysts to develop ways to address the steps outlined below.

- Increase the number of permanent FTE deck, engine, terminal, and Eagle Harbor employees to reduce, though not eliminate, overtime expenses
- Improve absence forecasting to enable filling PTO and LWOP absences that can be predicted by historical patterns rather than through overtime

Training Budget Adequacy

The WSDOT workforce management strategy is a robust document outlining the components of a comprehensive plan which addresses the need for overall future staffing needs. The Center recommends that the Legislature provide funding for staff time to participate in the training, at all levels throughout WSF. Specific recommendations for operationalizing are below:

- Quantify the costs associated with maintaining USCG approved courses, including administrative costs of filing paperwork, being present and prepared for USCG audits, maintaining gear and training aids, training of Instructors, etc.
- Develop baselines of safety performance measures within the Safety Management System (SMS).
- Align in-house training with SMS near-misses or non-conformities to target training to rather than requiring all training for all staff
- Track safety performance measures and correlate to training, or lack of training for specific employee

- Track individual new-hire performance as they progress through the organization, especially with regards to safety related categories
- Track near-misses or non-conformities that can be attributed to either a lack of training, or a reduction in the above after training
- Conduct a detailed cost-benefit analysis of the new hire orientation training session, especially as it compares to other large domestic ferry fleets that do not conduct similar training

Government and Collective Bargaining Agreements

- Engage labor leadership to participate in the developing and implementation of the workforce management program
- The Center recommends that the Washington State Legislature continues and strengthens its interest in developing a workforce management program

ACKNOWLEDGMENTS

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APPENDIX

List of Locations and Outlets for WSF Recruiting

List of recruiting locations for WSF, such as colleges, vocational schools, training programs, and conferences

- Cal Maritime
- Youth Career & EDU Fair
- Benton/Franklin County Fair
- Mukiltoe Lighthouse Festival
- Engineering Expo (University of Texas)
- Central WA State Fair
- Apprenticeship and Career Fair, Cowlitz County
- Kitsap Navy Job Fair, Bremerton, WA
- WSU Career Fair, Pullman, WA
- University of Idaho Career Fair, Moscow, ID
- Perry Tech Employer Expo, Yakima, WA
- AGC Education Foundation Construction Career Day, Magnuson Park
- Gonzaga University Engineering and Computer Science, Spokane
- Seattle U Business & Engineering Career Fair, Seattle University
- UW Science and Engineering Fair
- Oregon State University, Corvallis, OR
- UW Tacoma STEM Fair
- Woodland High School Career/Job Fair
- Jefferson County High School Career Fair
- Okanogan Career Fair, Okanogan
- Portland State University – Engineering, Technology, & Internship Career Fair
- CTE Beyond High School, Kent, WA
- NCW College & Career Expo
- Oregon Institute of Technology, Klamath Falls, OR
- Heritage High School – Girls in STEM, Vancouver, WA
- Seattle Bainbridge Ferry Community Outreach, Seattle Bainbridge Ferry
- WorkSource Job Fair, Olympia National Guard Armory
- Issaquah Chamber of Commerce 8th Annual Great Careers Conference, Bellevue College
- Veterans Resource Fair, Red Lion, Richland, WA

List of recruiting and websites and industry publications) where WSF posts job openings

- [Careers.wa.gov](http://careers.wa.gov)
 - [Glassdoor](https://www.glassdoor.com/)
 - [Indeed](https://www.indeed.com/)
 - [Monster](https://www.monster.com/)
- [LinkedIn](https://www.linkedin.com/)
- [WorkSource](https://www.worksource.gov/)

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