2017 Wisconsin Highway Maintenance Workforce Survey

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16. Abstract The Wisconsin Highway Maintenance Workforce Survey gathers the background information about the highway maintenance workforce in Wisconsin needed to develop a career pathway and credentialed training. The report presents supporting information for assessing employer interest and target audience for developing a Wisconsin apprenticeship program in Highway Maintenance. This report provides survey data that can be used to estimate the numbers of highway maintenance workers from entry to supervisory levels employed by local governments in the state. The report characterizes the scope of highway maintenance jobs in the workforce, prior education, and experience of entry-level workers. Survey data can be used to estimate the percentage of employers having difficulties filling positions and the number of positions left unfilled. The survey data includes ranked lists of skills and competencies among the applicants. The survey includes self-assessments on the success of various strategies to recruit, train and retain applicants into entry-level positions. The report characterizes training requirements, sources of training provided by employers, and common reasons why workers leave highway maintenance jobs. The report presents findings on employer interest in and familiarity with apprenticeship programs and the ACT National Career Readiness Certificate. The report summarizes comments and thoughts from employers on the future vision at highway maintenance agencies including rebranding highway maintenance occupations and suggested new occupations.			
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[1] Each FHWA Regional Center has assembled a group of representatives from the private and public sectors to provide guidance on each discipline of the National Transportation Career Pathway Initiative.

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Introduction

Who Maintains the Roads in Wisconsin?

The answer is complicated. According to the Wisconsin Department of Transportation (WisDOT) (*1*), there are 115,371 miles of public roads in the state, from interstate freeways to city and village streets. Counties are responsible for maintaining 11,746 miles of the state highway system. The other 103,625 miles are improved and maintained by workforce employed by cities, towns, counties, and villages in which they are located.

WisDOT is unlike other state DOTs in the country when it comes to maintaining state highways. The department contracts all of the state and interstate highway maintenance work to its 72 counties. The work is overseen by the County Highway Commissioners. Counties employ the frontline workers.

In Wisconsin, the role of the DOT is to develop the policies, standards, and manuals, including information databases. WisDOT also provides leadership on new practices, operational improvements, and encourages the implementation of new technologies.

Outside of Wisconsin, the state DOTs either employ highway maintenance workers—who then make up the largest part of their workforce—or contract out to private companies to maintain the infrastructure. Some states maintain their roads with a combination of strategies, utilizing both private contracts and DOT employees.

Survey Strategy and Scope

The Wisconsin Highway Maintenance Workforce Survey met several goals. The survey was designed to learn about the highway maintenance workforce in Wisconsin, get the background information needed to develop a ***career pathway*** and credentialed training, and to assess opportunities to establish a "middle-skills" apprenticeship program.

> The U.S. Departments of Education, Health and Human Services, and Labor define a ***career pathway*** (*2*) as a "series of connected education and training strategies and support that enable individuals to secure industry relevant certification and obtain employment within an occupational area and to advance to higher levels of future education and employment in that area."

Table 1 summarizes the highway maintenance survey topics by goal. The survey was a vehicle to engage highway maintenance professionals throughout the state, to understand the demand for workers, and to generate employment data. The research teams' goals were to "fill in the gaps" on several fronts, determining the demand for highway maintenance workers, identifying curriculum being used to train workers, and itemizing any credentials that workers possess.

Some questions focus on identifying issues that could be solved by creating an apprenticeship. According to USDOL's Apprenticeship Toolkit (*3*), an apprenticeship can be an appropriate workforce strategy if an organization is experiencing any of the following workforce challenges:

- Jobs for which it is difficult to find workers with the right skills
- Positions with high turnover
- Occupations where a highly skilled workforce is retiring soon
- Challenges helping workers keep pace with ongoing industry advances

- Positions requiring skills that can be learned on the job
- Difficulty in attracting new and more diverse talent pools

Lastly, the survey serves as background material for stakeholders, members of the workforce, and educational partners working to develop career pathways in this area.

The MTWC, at the University of Wisconsin–Madison, as part of the *National Transportation Career Pathway Initiative*, engaged the Wisconsin County Highway Association and the Wisconsin Chapter of the American Public Works Association (APWA) to develop the survey on highway maintenance in Wisconsin.

MTWC engaged several organizations to develop a marketing campaign: Wisconsin Transportation Development Association, League of Wisconsin Municipalities, Wisconsin County Highway Commissioners Association, APWA Wisconsin Chapter, Wisconsin Transportation Road Builders Association, Wisconsin Towns Association, and the Dane County Highway Commissioner. The campaign included a series of emails, blog articles, and a postcard. A survey announcement postcard was mailed. Reminders were made by email and, in select cases, by phone. MTWC also attended two events to talk about the highway maintenance career pathway initiative and to encourage people to take the survey.

The **National Transportation Career Pathways Initiative** is funded by USDOT to develop career pathway templates in the following disciplines: Engineering, Planning, Environment, Safety, and Operations. The research team consists of five regional transportation workforce centers. The Midwest Transportation Workforce Center is focused on the Engineering discipline (*4*)

Target Audience and Respondents

While the target audience was the county commissioners, MTWC also sent the survey to the highway maintenance engineers at WisDOT and its five regional offices; the public works directors or city engineers (whichever were appropriate) of each city, village, and town having over 2,000 in population; and five private contractors that perform highway maintenance within the state. In total, a survey link was emailed to 541 contacts.

Highway maintenance policy, as explained earlier, comes from the WisDOT staff. MTWC also wondered whether there were highway maintenance engineering and planning skills that were lacking in the workforce, or if there were issues in recruitment or retention at WisDOT.

Table 1. Survey Design and Workforce Development Goals

Survey Topic	Workforce Demand	Training Identification	Apprenticeship Development	Career Pathway Plan	Survey Heading
Job Classification—Job Titles per Level				√	Highway Maintenance Jobs in Your Organization
Total FTE, Vacancies 2017, Positions To Fill 2017, Number of Employees by Job Classification, Use of Seasonal Workers	√		√	√	Highway Maintenance Jobs in Your Organization
Recruitment – Issues, Methods	√		√	√	Recruiting Highway Maintenance Workers, Recruitment Methods
Applicant Pool Skills	√		√	√	Applicant Pool Skills
Retention – Issues	√		√	√	Retention
Characteristics of Level I Workers – Pathways, Age			√	√	Pathways of Level 1 Workers, Age of Level 1 Workers
Salaries: Pay Range Actual, Average Actual, Hourly Wages for Permanent and Seasonal Workers				√	2016 Salaries
Training – Who, What and How		√		√	Training—Levels 1–4
Technologies –In Use Now, Technology Adoption in Future Years, Skills Needed for Future				√	Technology Adoption in Highway Maintenance
Greatest Workforce Challenge	√		√	√	Workforce Challenges
Your Career Pathway			√	√	Your Career Pathway
National Career Readiness Certificate				√	Workforce Development Topics
Apprenticeship			√	√	Workforce Development Topics
Competency Model			√	√	Workforce Development Topics
Opinions on the Future of Highway Maintenance			√	√	The Future of Highway Maintenance

Table 2 lists the job titles for 76 survey respondents who provided information about themselves—approximately half of all respondents. The table also shows the agency jurisdiction of these and other respondents. Among them are 29 of Wisconsin's county highway commissioners and 13 directors of public works.

Table 2. Survey Respondents–Positions and Work Agency Jurisdictions

Respondent's Position	Number of Respondents Working for:					Total
	State	County	City	Town	Village	
Highway Commissioner		29				29
Director of Public Works		1	10	2		13
Superintendent - Highway, Street, Road, Public Works			4	3	2	9
Town Clerk/Treasurer				8		8
Supervisor (Highway, Road, Public Works, Maintenance, Operations)	3		1	3		7
Foreman			1	1		2
Administrator				1	1	2
Other or Title not provided	3	16	21	13	18	73
Grand Total of Respondents	**6**	**46**	**37**	**31**	**21**	**143**

Figure 1 shows the percentage breakdown of survey participants according to whether they employ workers at Levels 1–4, and if yes, the participant's local agency justification. The data showed that over 80 percent of the participants represent employers of Level 1 (entry level) workers. The graph was created from responses to questions Q4, Q19, Q34, and Q49, "Does your organization employ [Level 1, Level 2, Level 3, and Level 4] workers?" The chart shows the number of respondents in each series. The largest group of respondents, approximately 40, represents counties that employ highway maintenance workers. The next largest group represents cities that employ highway maintenance workers. These two groups comprise over 50 percent of the participants.

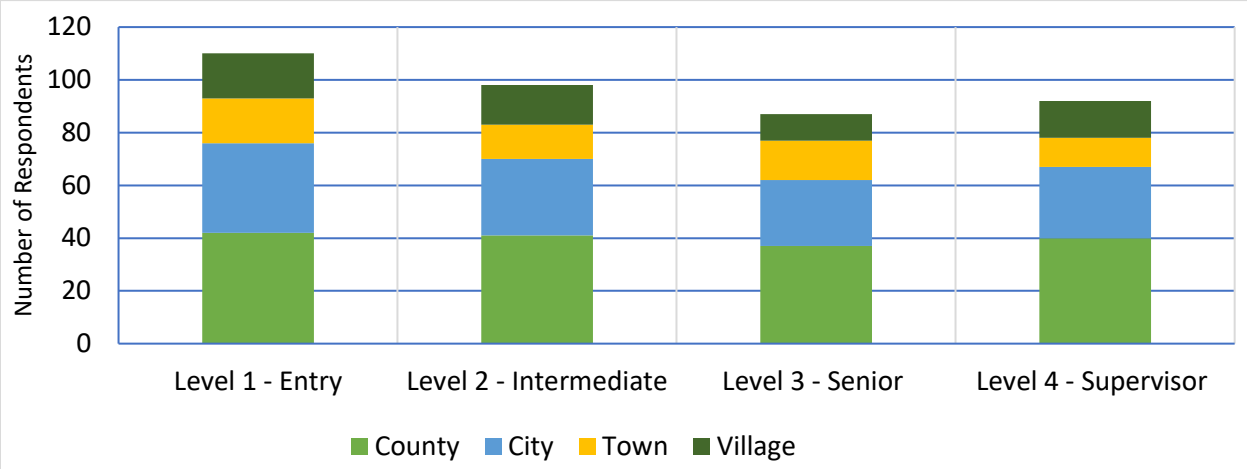

Figure 1. Number of Survey Participants by Jurisdiction and Employer of Highway Maintenance Workers

For those that responded “No” (not shown in Figure 1), we can only surmise that small municipalities consist of 1 or 2 workers that may be cross-trained. We also received some comments during the survey window that the skills levels description did not apply to their organization.

Report Organization

The purpose of this report is to present supporting information for assessing employer interest and target audience for developing a Wisconsin apprenticeship program in Highway Maintenance. To accomplish this purpose, the results of the survey are organized into five chapters.

The chapter on ***Wisconsin Highway Maintenance Workforce*** describes the scope of jobs for highway maintenance and the common job titles for workers employed by local governments in the state of Wisconsin. This chapter contains survey data that can be used to estimate the numbers of highway maintenance workers, from entry to supervisory levels, employed by local governments in the state. The chapter provides a characterization of prior education and experience of entry-level workers.

The chapter on ***Highway Maintenance Workforce Demand in Wisconsin*** contains survey data and quantitative statistics are included that can be used to estimate the percentage of employers having difficulties filling positions and the number of positions left unfilled. Finally, the chapter includes an assessment of the skills and competencies among the applicants for highway maintenance jobs.

The chapter on ***Workforce Development Practices*** presents self-assessment on the success of various strategies used by employers to search for and recruit applicants into entry-level positions. The chapter provides a characterization of training requirements for workers and the sources of training provided by employers. Finally, the chapter includes an assessment of common reasons why workers leave highway maintenance jobs.

The chapter on ***Interest in Registered Apprenticeship and Credentials for Highway Maintenance Workers*** assesses employer interest in and familiarity with apprenticeship programs and the ACT National Career Readiness Certificate. Data are included for estimating the interest of highway maintenance workers in an apprenticeship program and the certificate. Finally, this chapter contains survey data that can be used to estimate the number of local government employers in Wisconsin interested in developing an apprenticeship program and the number of apprentices that would be sponsored.

Finally, the chapter on ***Outlook, Rebranding, and Recommendations*** summarizes the comments and thoughts from employers on the future vision of highway maintenance. Similarly, there is a table of open-ended responses to another question about rebranding highway maintenance occupation including a few suggested new occupations. This chapter ends with a list of recommendations from the authors and researchers.

The report appendix contains the survey instrument.

Wisconsin Highway Maintenance Workforce

Definitions and Job Titles

Certain job titles used at Wisconsin counties are different from those used at other municipalities. To map the titles from one organization to the next, we used AASHTO's job descriptions (*5*) included in their salary survey definitions. The job descriptions are based on four skill levels in the career progression of maintenance workers (*6*). While these skill levels are translated to a four-step career progression in many DOTs, we did not know what to expect at the counties and local governments. The following are the AASHTO definitions and tables of alternative job titles in use at local agencies.

Level 1–Entry highway maintenance work typically requires graduation from high school, or GED or equivalent experience. Employees at this level work under close supervision and perform routine equipment operations and physical labor activities. They may operate equipment such as dump trucks, front-end loaders, tractors, motor graders, high-reach excavators, and support equipment such as air compressors, oil distributors, and pneumatic tools.

Q5: In your organization, what job title is associated with the Level 1 worker?

Table 3. Job Titles for Level 1–Entry Workers in Wisconsin

Title	Count of responses representing:				Grand Total
	City	County	Town	Village	
Crew Worker	1		1	1	3
Laborer	7	7		6	20
Maintenance Worker	6	15	4	2	27
Operator	8	8	1	1	18
Patrolman		4	2		6
Public Works Employee	5		5	1	11
Assistant		1	1		2

Level 2–Intermediate highway maintenance work typically requires graduation from high school or GED or equivalent experience. This level also requires one-to-two years of experience operating heavy equipment and performing roadway maintenance. They work under moderate supervision and operate multiple gasoline and diesel-powered construction equipment such as heavy bulldozers and power shovels as well as related heavy construction equipment exceeding four tons.

Table 4. Job Titles for Level 2–Intermediate Workers in Wisconsin

Title	Count of responses representing:				Grand Total
	City	County	Town	Village	
Crew Worker	2		2	1	5
Foreman				1	1
Laborer	1	1		3	5
Maintenance Worker	4	8	4	1	17
Operator	17	22		2	41
Patrolman		4	3		7
Superintendent				1	1
Supervisor			1		1
Lead		2		1	3

Level 3–Senior highway maintenance work typically requires graduation from high school or GED or equivalent experience, plus four or more years of full-time experience in roadway maintenance. Employees at this level work under limited supervision. They function as a crew leader for staff specializing in highway maintenance services and assist in the coordination of planning work schedules, providing leadership and guidance to crews, coordinating maintenance operations in the field, monitoring work performed, compiling crew work statistics, and documenting crew activities.

Q35: In your organization, what job title is associated with the Level 3 worker?

Table 5. Job Titles for Level 3–Senior-Level Workers in Wisconsin

Title	Count of responses representing:				Grand Total
	City	County	Town	Village	
Lead	9	7	2	3	21
Maintenance Worker		2	1		3
Operator	5	4			9
Senior	1				1
Specialist		1			1
Superintendent	1	3	2	1	7
Supervisor	1	2	3		6

Level 4–Supervisor highway maintenance work typically requires graduation from high school or GED plus experience equal to five or more years of full-time experience in highway/roadway maintenance, highway construction work, or highway materials inspection work. Employees at this level are top-level supervisors of maintenance functions and supervise multiple locations within an assigned area of operations. They are often assisted by a Level 3 worker.

Q50: In your organization, what job title is associated with the Level 4 worker?

Table 6. Job Titles for Level 4–Supervisor Workers in Wisconsin

Title	Count of responses representing:				Grand Total
	City	County	Town	Village	
Commissioner	1	2			3
Crew Leader	1				1
Director of Public Works	6		3	3	12
Foreman	4		1	2	7
Leadman	1		1		2
Manager	1	6		1	8
Specialist		1			1
Superintendent	10	27	2	1	40
Supervisor	3	3	4	3	13

Estimated Employment of Highway Maintenance Workers in Wisconsin

Table 7 shows the total estimates for the number of employees in Levels 1 to 4 for all agencies responding to the survey. The values shown for Q2 are counts of survey participants, not counts of employer participants. Therefore, it is important to note that the estimated numbers of employees listed for the other questions in Table 7 are the sums of responses from all survey participants. Wisconsin has a significant number of highway maintenance workers, particularly at the counties. The values in Table 7 are not inclusive of all employers in the state, and the values may be overestimated if an employer had more than one survey participant.

Table 7. Highway Maintenance Employment in Wisconsin

Survey Question		City	County	Town	Village	Total
Q2	What type of organization do you work for?	31	43	22	15	111
Q64	For calendar year 2016, what was the total number of full-time, permanent employees in the highway maintenance section of your organization? Include Levels 1–4 and staff beyond Level 4. Do not include clerical staff.	415	1594	36	80	2125
Q66	In calendar year 2016, how many vacancies did your organization have for Levels 1–4?	38	214	7	8	267
Q68	In 2017, how many-full time, permanent Levels 1–4 positions will your organization need to fill?	46	246	3	13	308
Q15	In 2016, what was the total number of employed, permanent, full-time Level 1 positions in your organization?	190	716	25	53	984
Q17	How many winter season FTE Level 1 highway workers does your organization usually hire?	48	38	12	10.5	109
Q18	How many summer season, FTE Level 1 highway workers does your organization usually hire?	153	193	3	23	372
Q30	In 2016, what was the total number of employed, permanent, full-time Level 2 positions in your organization?	213	706	22	44	985
Q32	How many winter season FTE Level 2 highway workers does your organization usually hire?	3	0	6	0	9
Q33	How many summer season, FTE Level 2 highway workers does your organization usually hire?	3	12	3	0	18
Q45	In 2016, what was the total number of employed, permanent, full-time Level 3 positions in your organization?	55	168	18	19	260
Q47	How many winter season FTE Level 3 highway workers does your organization usually hire?	1	3	1	0	5
Q48	How many summer season, FTE Level 3 highway workers does your organization usually hire?	1	0	1	0	2
Q60	In 2016, what was the total number of employed, permanent, full-time Level 4 positions in your organization?	37	105	11	13	166
Q62	How many winter season FTE Level 4 highway workers does your organization usually hire?	1	0	0	0	1

Pathways of Entry-Level Workers

A survey goal was to understand the current pathway of workers and what work experiences or education led them to this occupation. In conversations at conferences throughout the state, employers indicated that, due to the decline of family farming in Wisconsin, the pool of workers that historically filled these positions is shrinking. The bar chart in Figure 2 shows grouped percent of survey respondents for how employers characterize the entry path for highway maintenance workers.

Q91: Currently, about how many of the Level 1 workers in your organization have the following experience or education?

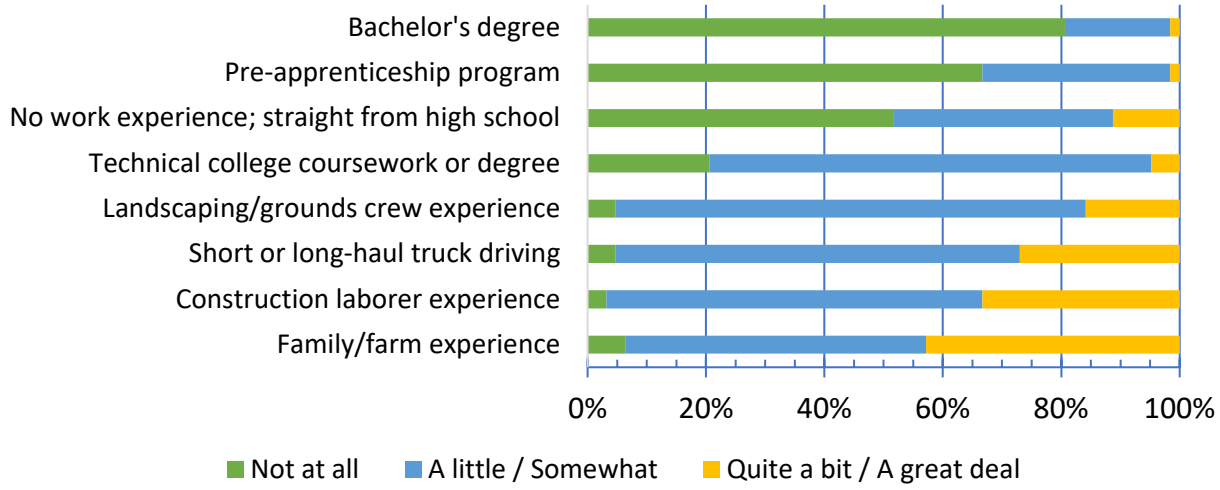

Figure 2. Pathways of Entry-Level Workers.

Asking the age of the workforce helped us understand whether these occupations are being filled with workers coming straight from high-school. Figure 3 shows that most workers are older and come into the job with experience from the construction sector, family farm experience, and truck driving.

Q92. How old are the majority of your full-time, permanent, Level 1 workers?

Figure 3. Age Distribution of Entry-Level Highway Maintenance Workers in Wisconsin

Highway Maintenance Workforce Demand in Wisconsin

Estimate of Employers Having Difficulties Filing Positions

Q77 – Q80: Does your organization experience any problems filling Level [1, 2, 3, or 4] positions?

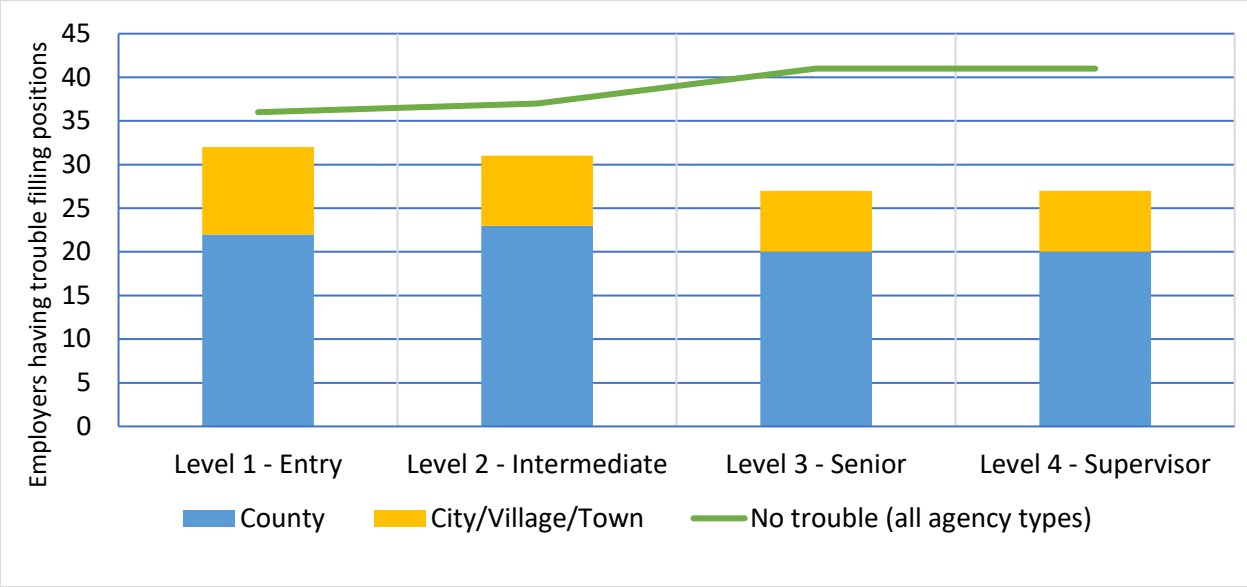

Figure 4. Estimate of Employers Having Trouble Filling Highway Maintenance Positions

Employer Assessment of Applicant Pool for Entry-Level Positions

Q81 How difficult is it for your organization to fill Level 1 highway maintenance positions because...

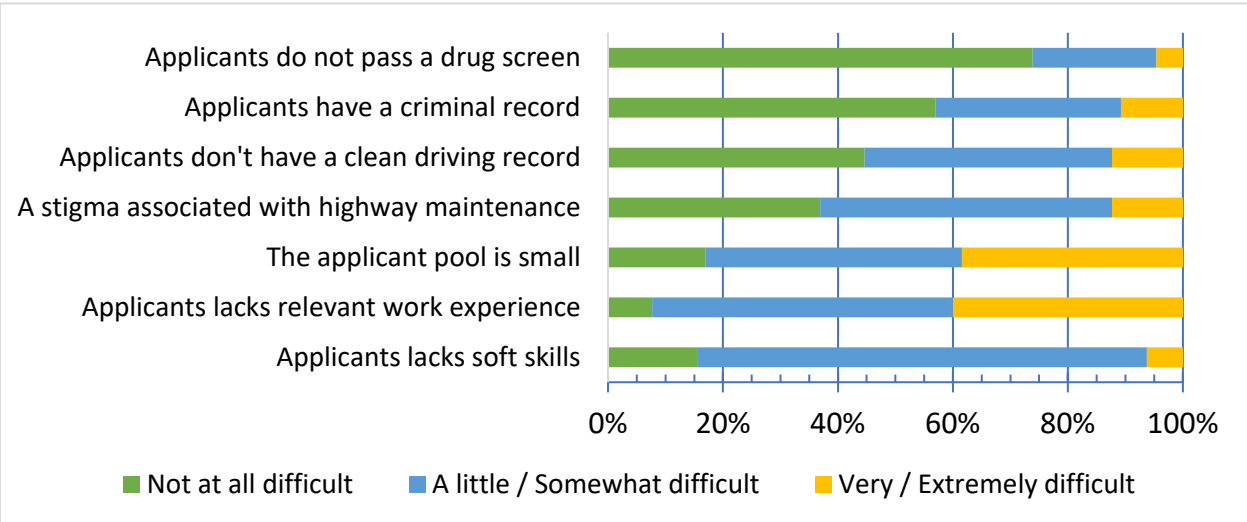

Figure 5. Common Reasons Why Entry-Level Positions are Difficult to Fill

Respondents had the opportunity to add other reasons that make it difficult to fill Level I highway positions. Some of the comments referred to low wages. Others focused on CDL issues as well as the quality of the applicant pool. The comments include the following:

- "Proper CDL endorsements/Does not have CDL/CDL drivers make more money other places"
- "Applicants do not meet the base requirement of possessing a CDL"
- "Not enough applicants, few that even have basic qualifications"
- "Abundance of jobs in the area that pay more"
- "Surrounding counties offer a higher starting wage (applicant pool and employee retention suffer)"
- "Private pay and benefits exceed what we are able to offer on the public sector"
- "Level 1 type people don't seem to have the ambition they used to.
- "Equipment operation"
- "Rate of Pay, willingness to work long hours in the winter months, need to be on call 24/7 November through March"
- "Lack of applicants"
- "Starting pay does not match minimum qualifications. Class A CDL plus Tanker endorsement and 6 months experience operating Heavy equipment. We can't attract many applicants when starting pay is at 17.01/hr."
- "Previous recruitments had very small pool of applicants. Recent reclassification with pay increase resulted in much larger pool"
- "Proximity to Twin Cities metro"
- "County policy on where employee can reside"
- "CDL and drug test"

Desirable and Minimum Requirements

Q88 When your organization is hiring Level 1 highway maintenance workers, how hard is it to find applicants who have…

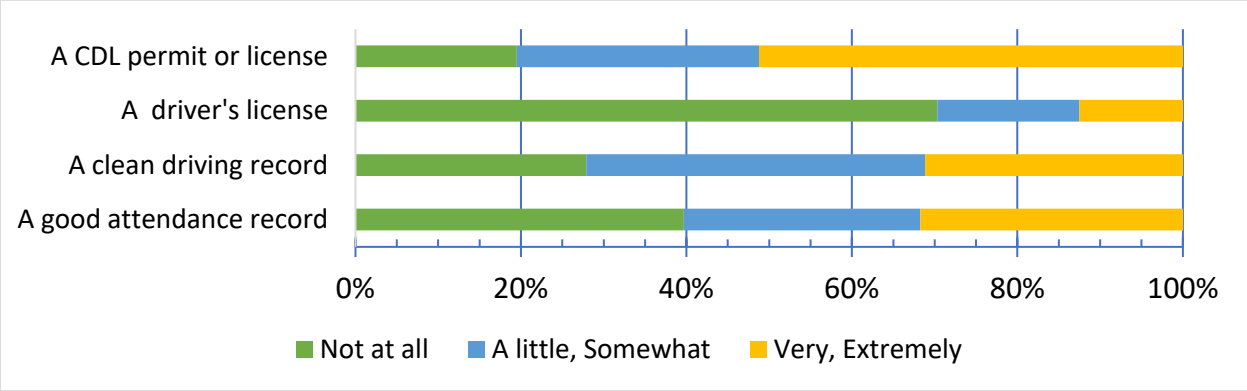

Figure 6. Minimum Employment Requirements that are Hard to Find in Entry-Level Applicants

Q87: How hard are the following skills to find when your organization is hiring Level 1 highway maintenance workers?

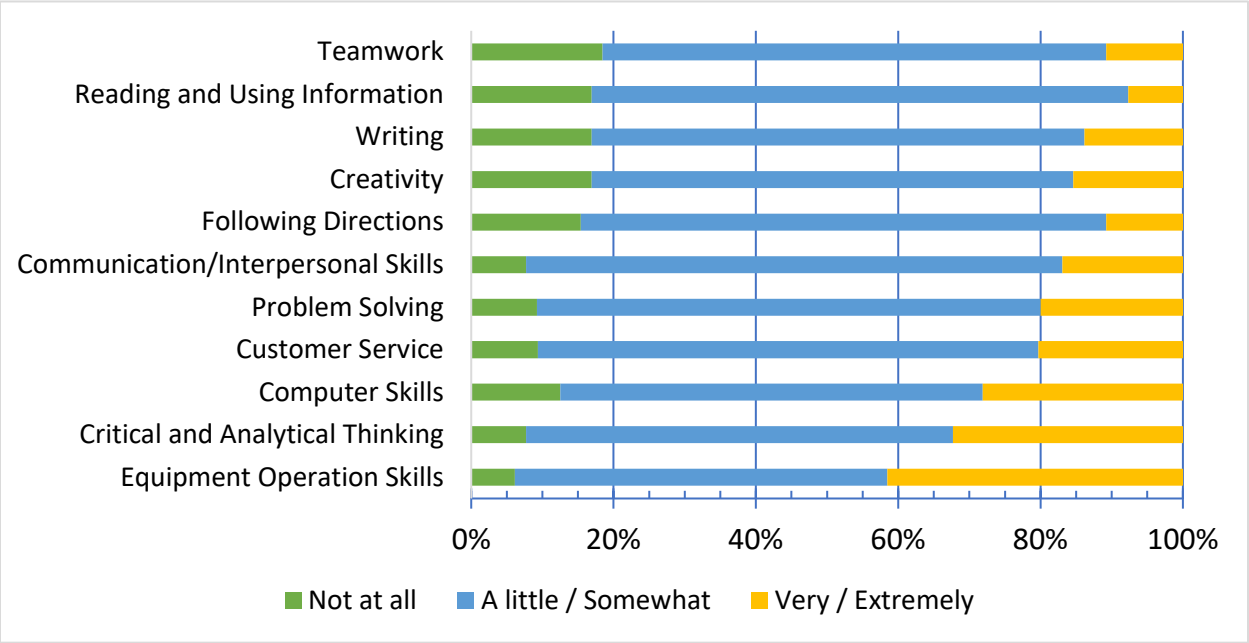

Figure 7. Desirable Skills that are Hard to Find in Entry-Level Applicants

Workforce Development Practices

Understanding the issues that drive the demand for workers is the first step in workforce development. In cases where recruitment or retention are issues, employers must be asked, "Is this a training issue? Or, is it a lack-of-workers issue? Or, is it both?"

Recruiting Entry-Level Workers

Figure 8 provides a snapshot of the state of practice in recruiting workers. The figure shows grouped responses to Q84. The recruiting methods listed for Q84 were identified in a scan of workforce development practices and input from partners. Respondents were also asked to provide additional methods that worked the best. They include:

- “Believe it or not Facebook has been our best recruitment tool”
- “Local advertisement, most applicants are local and current pay scales are higher than other employers makes the county attractive, good benefits program”
- “Ad in local paper”
- “Getting the word out from the staff”
- “Online websites such as Indeed”
- “Newspaper Ad”
- “Public notices in the newspaper
- “Newspaper and local radio adds”
- “Local news publications and word of mouth”

Q84: How well have each of the following methods worked for your organization in recruiting Level 1 highway maintenance workers?

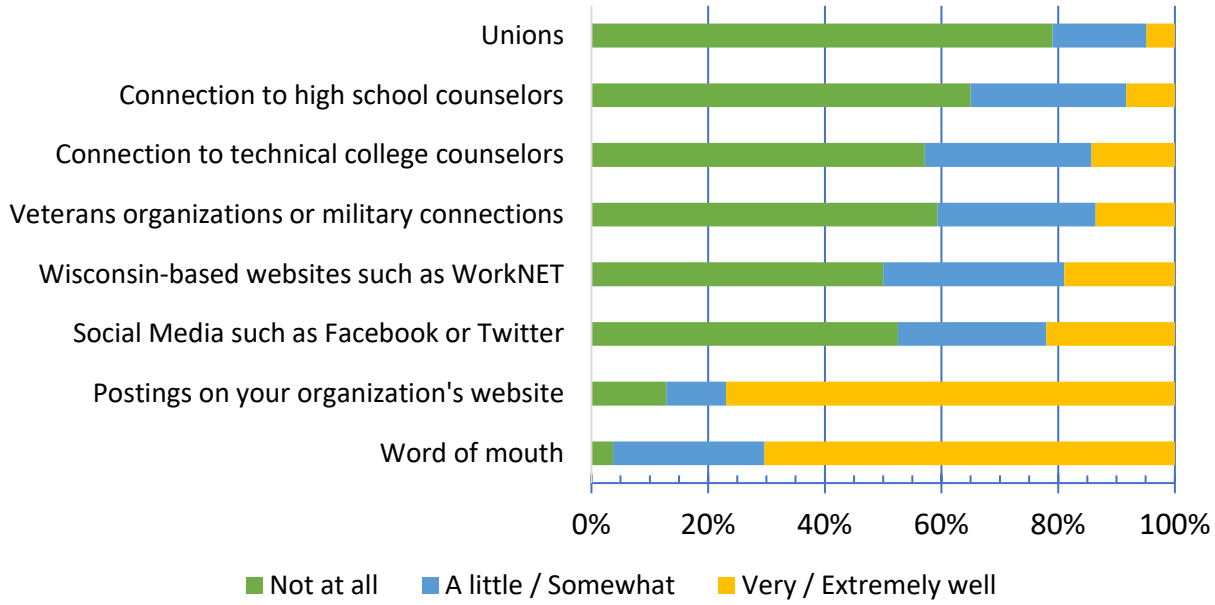

Figure 8. Methods for Recruiting Entry-Level Highway Maintenance Workers

Retaining Highway Maintenance Workers

Q89: How much do the following factors contribute to why highway maintenance workers in your organization leave?

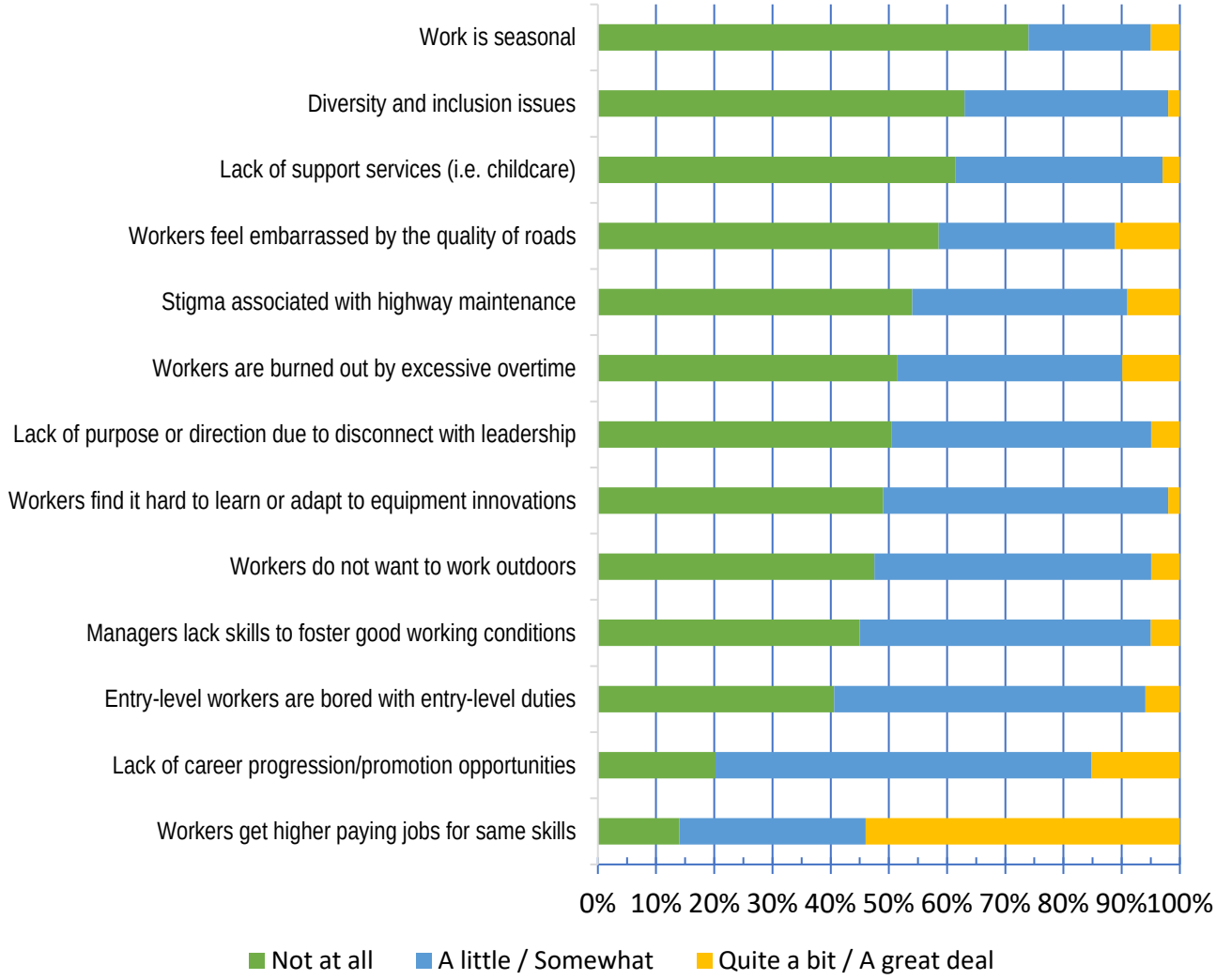

Figure 9. Factors Contributing to Why Highway Maintenance Workers Leave the Job

Respondents had the opportunity to write in reasons other than those listed in Figure 9. They include:

- Money/Wages/Wages between operators (5 responses)
- Snow plowing hours and demands/Weekends and Holidays
- Retirement
- Better paying position offered/private contractors offers
- Elected officials
- Career change
- Disciplinary

Training Entry-Level Workers

Q94 How often are Level 1 workers at your organization trained by these methods?

As shown in Figure 10, on-the-job training is the prevalent way Level 1 workers are trained, followed by in-house training prior to start dates. A small percentage of employers are using simulation as a training modality.

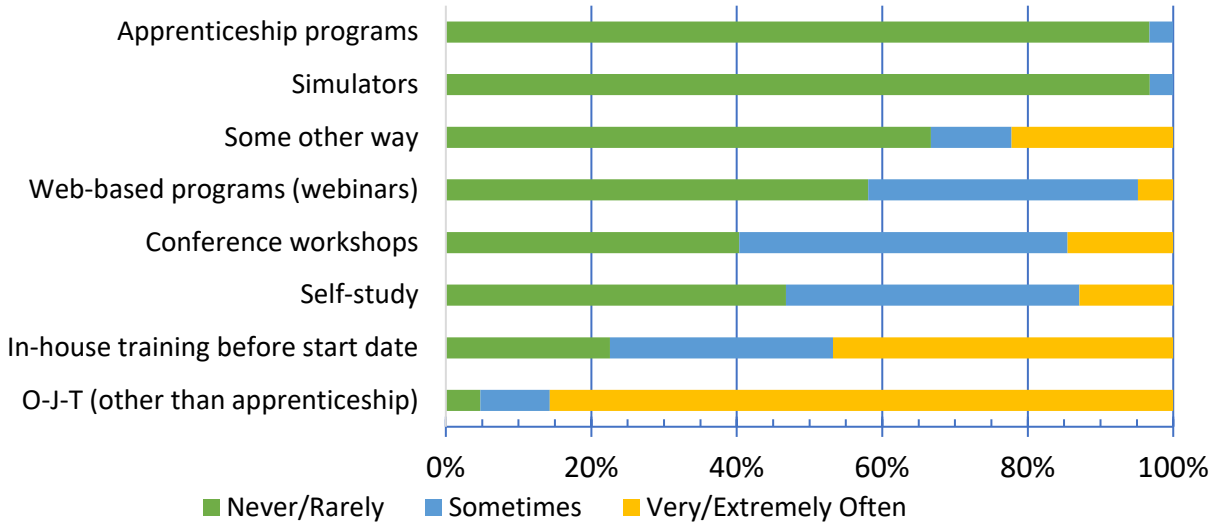

Figure 10. Methods for Training Entry-Level Highway Maintenance Workers

The responses that were recorded under “Some other way” include:

- “TIC courses” (Transportation Information Center at the University of Wisconsin-Madison)
- “Training videos”
- “On the job experience”
- “Meetings/Yearly safety meetings”
- “In-house semi-annual training/twice a year training days”
- “Train by others”
- “Shadowing”
- “Experience in construction”

Q95: Who trains your Level 1 workforce?

Figure 11 shows the responses to Q95. About 65 percent of responses say the in-house staff train the entry-level workers most of the time or always. The chart shows that about 75 percent of the employers rely on some training from “other organizations.”

Many respondents provided a write-in comment to explain. Besides equipment manufacturers and professional groups as shown, local agencies rely on training required by the local government employer. In many cases, the training is provided by, or through, the insurance carriers for the local government.

Responses for “Other organizations” include:

- “3rd party vendors for core compliance
- “Insurance company (7 responses) – County Mutual”
- “Alpha Terra Safety training”
- “Construction industry/Past construction employment”
- “Equipment reps”
- “Other employees/Foreman/other crew members”
- “UW Extension, TIC” (Transportation Information Center at University of Wisconsin-Madison
- “Foreman/other crew members”
- “Wisconsin County Highway Association”

During a presentation of the survey’s findings in May 2018, attendees corroborated that insurance providers provide mandatory training for municipal employees.

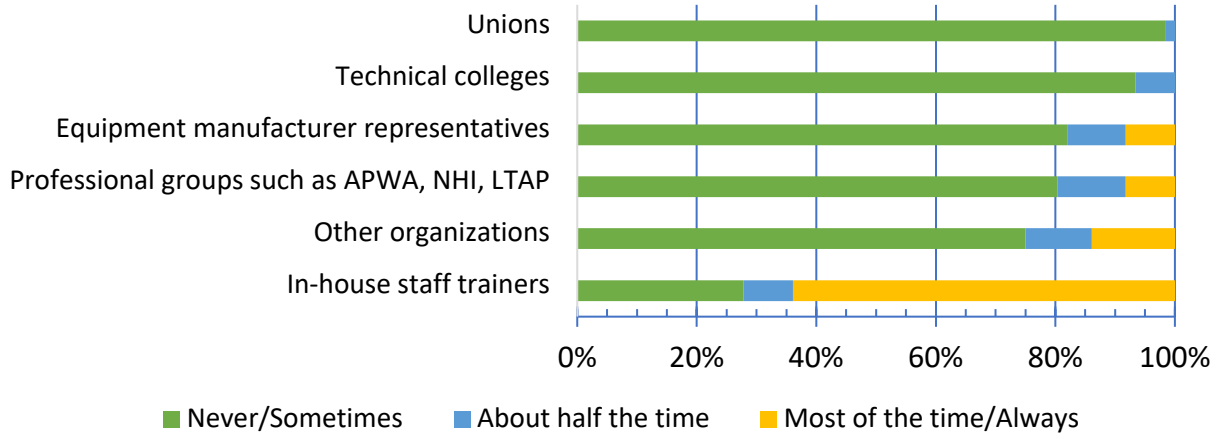

Figure 11. Training Providers for Entry-Level Highway Maintenance Workers

Interest in Registered Apprenticeship and Credentials for Highway Maintenance Workers

Registered Apprenticeship is a proven model that helps employers retain workers over a period of training while workers receive a credential. Apprenticeships can be designed to provide up-front training, or apprentices can work part of the week and attend training the rest of the week. Mentorship is one component of apprenticeship. At the end of the apprenticeship, workers are awarded a certificate that is recognized across the country.

In Wisconsin, the Department of Workforce Development awards the certificates. Apprenticeships have been historically popular in the construction sector. Lately, however, industries as diverse as manufacturing, IT, insurance, and healthcare have been developing apprenticeships to attract entry-level workers, to upskill their current employees, or to provide a credential for programs the employer is already doing, such as a rotational program or on-the-job training. Employers in both the public and private sectors can sponsor apprentices. In some cases, apprenticeships can count toward a degree.

At the outset of the National Transportation Career Pathway Initiative in Highway Maintenance, we noticed a vast number of training opportunities, including on-the-job training (OJT). We wondered if we could organize the classroom training and the OJT that workers receive into the form of an apprenticeship model that would incorporate certifications and provide a national credential for workers in Highway Maintenance—something that currently does not exist in Wisconsin. MTWC did find other public-sector organizations with highway maintenance apprenticeships, including West Virginia and the Department of Public Works of Edmond Oklahoma. The apprenticeship from Edmond Oklahoma seemed the most relevant model for Wisconsin since employees in this state are most often under the Public Works function of a municipality and often have duties beyond those of highway maintenance.

We met with Karen Morgan, Director of the Bureau of Apprenticeship Standards at the Wisconsin Department of Workforce Development to learn more. According to Wisconsin Department of Workforce Development's website, apprenticeship is post-secondary education like a college or university. But, there is a big difference. Apprentices learn only a portion of their skills in a traditional classroom. They receive most of their training on the job while working for an employer who pays a good wage. The employment is the primary requirement for an apprenticeship—a job must exist in order for the apprentice to be trained. The classroom instruction is usually provided through the Wisconsin Technical College system. Apprenticeships must be at least a year long and have 144 hours of related training in Wisconsin.

At the end of an apprenticeship that has been registered with the USDOL or, in Wisconsin's case, the state's Department of Workforce Development, workers are awarded a certificate of completion, which is a credential that is recognized nationally. A certificate of completion can also be articulated into college credit.

Employers' Familiarity and Interest in Apprenticeships for Highway Maintenance

The questions asked in the Apprenticeship section of the survey included a short description of what an apprenticeship is and some questions to gauge understanding of, and interest in, apprenticeship. The responses show that few practitioners have expertise in the apprenticeship model. We see these responses as an opportunity to educate practitioners on the apprenticeship model and its costs and benefits as well as other workforce development strategies. In presenting findings of this survey to a group of practitioners in May 2018, we were

able to corroborate that few Commissioners or Public Works Directors were conversant in apprenticeship. Providing apprenticeship information will be a recommendation of this report.

Q121: How familiar is your organization with the apprenticeship model?

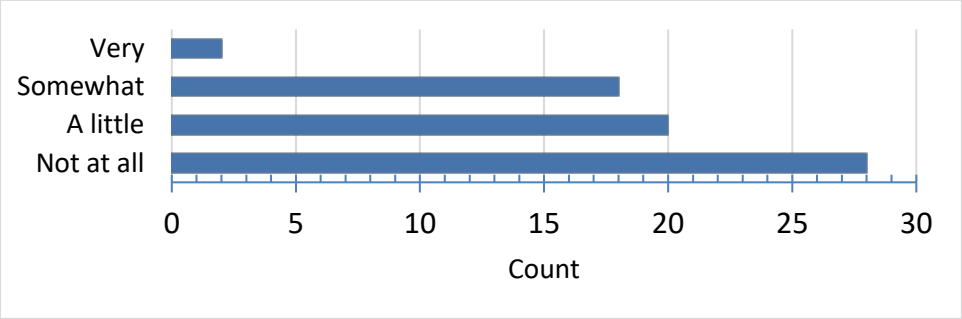

Figure 12. Awareness of Apprenticeship Among Wisconsin Employers of Highway Maintenance Workers

Q122: How interested are workers at your organization in pursuing credentials such as an apprenticeship?

The results are shown in Figure 13. It is important to recognize that the survey responses represent managers' opinions, rather than those of the relevant employees.

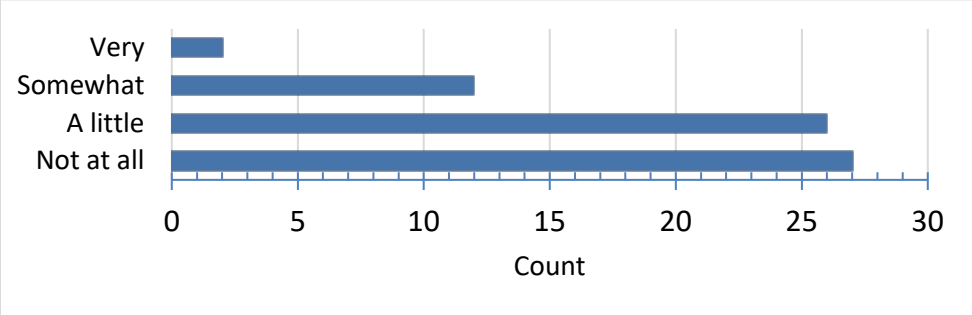

Figure 13. Potential Interest in Apprenticeship Among Incumbent Workers

Q123 How much do you support developing an apprenticeship for workers in your organization?

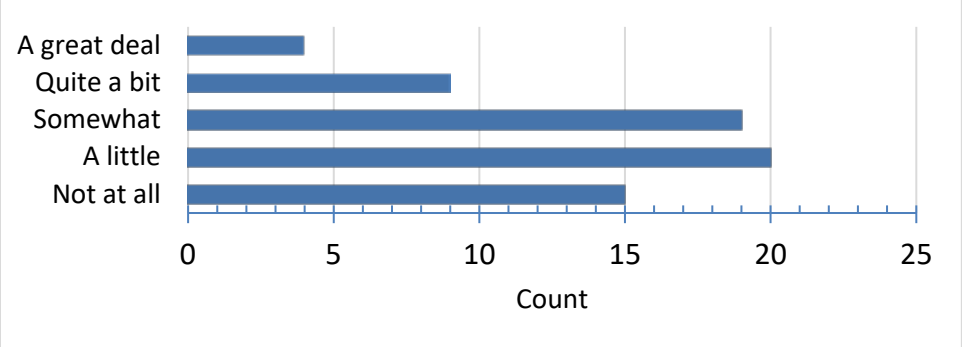

Figure 14. Employers' Interest in Apprenticeship for Highway Maintenance Workers

Estimate of Participating Employers and Highway Maintenance Apprentices in Wisconsin

Table 8 provides estimates of the number of workers at Level 1 through Level 4 at the local agencies that expressed “quite a bit” or “a lot” of interest in an apprenticeship program for highway maintenance workers. The table contains many of the same variables as in Table 7, but the totals are only for employers who indicated an interest in apprenticeship. The local agencies interested in apprenticeship programs employ a relatively high percentage of the estimated total employees. The percent of the total for many questions is greater than the expected proportion. For example, the eight-county respondents represent only 19 percent of all county respondents but the sum of vacancies in the calendar year 2016 (Q64) was 40 percent of the total quantified county agency vacancies. The survey results show similar findings for the cities and village agencies interested in apprenticeship. This finding confirms expectations that interest in apprenticeship programs is driven by worker shortage.

Table 8. Potential Employment for Highway Maintenance Apprentices in Wisconsin

	Survey Question	City	County	Village	Total
Q2	What type of organization do you work for?	3	8	1	12
		10%	19%	7%	11%
Q64	For calendar year 2016, what was the total number of full-time, permanent employees in the highway maintenance section of your organization? Include Levels 1–4 and staff beyond Level 4. Do not include clerical staff.	58	390	16	464
		14%	25%	20%	22%
Q66	In calendar year 2016, how many vacancies did your organization experience for Levels 1–4?	9	86	3	98
		24%	40%	38%	37%
Q68	In 2017, how many-full time, permanent Levels 1–4 positions will your organization need to fill?	10	53	1	64
		22%	22%	8%	21%
Q15	In 2016, what was the total number of employed, permanent, full-time Level 1 positions in your organization?	40	119	16	175
		21%	17%	30%	18%
Q17	How many winter season FTE Level 1 highway workers does your organization usually hire?	0	4	2	6
		0%	11%	19%	6%
Q18	How many summer season, FTE Level 1 highway workers does your organization usually hire?	14	34	0	48
		9%	17%	0%	13%
Q30	In 2016, what was the total number of employed, permanent, full-time Level 2 positions in your organization?	6	184	12	202
		3%	26%	27%	21%
Q33	How many summer season, FTE Level 2 highway workers does your organization usually hire?	0	2	0	2
		0%	17%	n/a	11%
Q45	In 2016, what was the total number of employed, permanent, full-time Level 3 positions in your organization?	5	31	1	37
		9%	19%	5%	14%
Q60	In 2016, what was the total number of employed, permanent, full-time Level 4 positions in your organization?	5	28	1	34
		14%	27%	8%	20%

Employers' Familiarity and Interest in the National Career Readiness Certificate (NCRC)

As part of a scan in workforce development practices, the use of the NCRC as a screening assessment for maintenance workers has produced some good results. The Technology Center of Dupage was the source for the description of the NCRC in the survey (*7*).

The National Career Readiness Certificate examination assesses an individual's skill level in three areas deemed critical for employability: Reading for Information, Applied Mathematics, and Locating Information. ACT, the organization that developed the college testing standard, researched over 16,000 occupations before developing these three WorkKeys® assessments for the NCRC.

Just as the ACT score indicates the college readiness of all students, the NCRC assesses the career readiness of all students and serves as a reliable predictor for workplace success of any applicant, student or adult. Thousands of private and public employers now ask for or require NCRC scores as part of the application process.

NCRC is awarded at four levels: Platinum, Gold, Silver, and Bronze. Each is an objective validation to employers anywhere in the U.S. that an individual has met or exceeded the necessary foundational skills for a percentage of the 16,000 occupations in the WorkKeys database. For example, a Gold certificate verifies that an individual has the necessary skills for 93% of occupations. An employer may use NCRC scores for baseline applicant screening; hiring and promotion decisions, and targeting employee training and development.

Many human resources offices use WorkKeys® assessments to screen applicants.

Q124: Have you heard of the National Career Readiness Certificate also known as the NCRC?

Of 68 respondents to this question, 66 (97 percent) indicated they had not heard of the National Career Readiness Certificate.

Q125: How interested are workers at your organization in pursuing credentials such as the National Career Readiness Certificate?

The results are shown in Figure 15. It is important to recognize that the survey responses represent managers' opinions, rather than those of the workers.

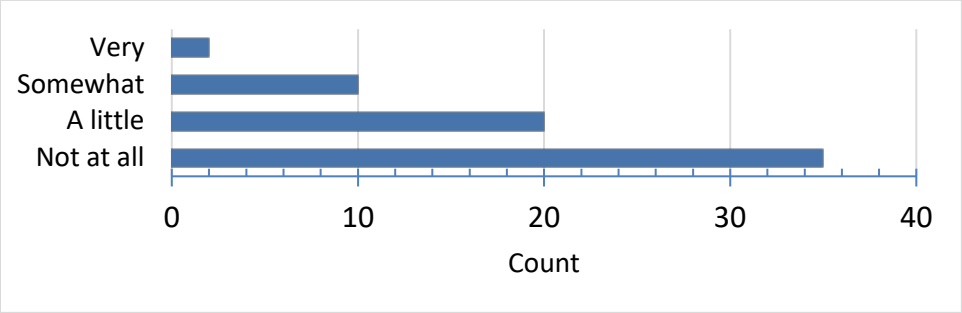

Figure 15. Workers' Interest in National Career Readiness Certificate Credentials

Q126: How supportive would you be of developing an awareness of the National Career Readiness Certificate in your organization?

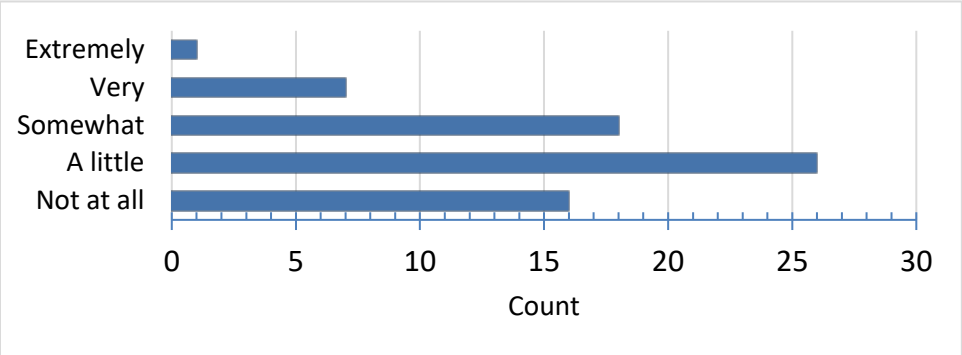

Figure 16. Support for Developing Awareness of NCRC Credentials for Highway Maintenance Workers

As in the case of the knowledge of the apprenticeship model, there is an opportunity to educate and utilize the NCRC for applicant screening and identifying skills level of incumbent workers to determine training to improve competencies. As students take this credential it will be imperative for organizations to accept and understand the meaning of this credential.

Outlook, Rebranding, and Recommendations

This report provides a snapshot of the characteristics of the highway maintenance workforce, identifies recruiting and retention issues and uncovers gaps in knowledge of workforce development practices in Wisconsin. This report provides background for the Department of Workforce Development and others who are unfamiliar with the industry of highway maintenance in Wisconsin.

Outlook

Highway maintenance workers are skilled in equipment operation and safety and must maintain a commercial driver's licenses (CDL). These middle-skill workers are in high demand in many heavy industries including construction, energy, and logistics. While we did not determine the age of the entire workforce, we can assume that highway maintenance, like other sectors, has a disproportionate number of workers who are likely to retire within 5–10 years.

The process of developing and launching this survey provided many opportunities to converse with highway maintenance managers. We heard that maintenance jobs are highly desired positions in some parts of the state due to the local economy. However other parts of the state are starting to encounter a smaller pool of talent, a finding reiterated in this survey. We heard that a decline in state funding for transportation and changes in benefits have hurt the public-sector worker. All these statements were echoed in the survey. An often-cited barrier to recruitment (and perhaps to the establishment of an apprenticeship) is a lack of pay progression, or generally low wages.

In an effort to gauge the future outlook among employers of highway maintenance workers, we included the following open-ended question. In this question, we were trying to determine if new themes and trends of automation, technology, and resilience were being considered moving forward. The following is how this question was phrased in the survey.

What will the future transportation corridor look like?

Will sustainability and climate concerns change how we think about our transportation corridors? Will future highway decisions be made through a sustainability lens? Will our pavements be storing or generating energy? Will the metrics used for transportation move beyond connectivity and pavement quality to include mitigation of environmental impacts (e.g., road dust from tires, brake pads, and road surface wear)?

The jobs and the skills we may need to have in the future (15 years) may be very different than today. Will the future highway maintenance workers also maintain other horizontal infrastructure, such as telecom? Will first responder duties be part of a future skill set? Will the impact of automation create new jobs that require different skills? Like shared mobility, will the highway maintenance worker be a shared occupation?

There are many scenarios ahead of us.

Q127: What type of future are you planning for?

The bulleted lists below summarize most of the written comments provided by the survey participants. The comments are sorted into categories emphasizing anticipated worker shortage, adoption of technology, declining budgets and infrastructure, and the status quo. Most employers are concerned about lack of funding due to statewide tax cuts and levy limits.

Worker Shortage

- “How can we attract and retain a qualified workforce?”
- “A shortage of qualified candidates with CDLs”
- “Planning for a workforce that needs to be trained on-the-job in maintenance work and equipment operation”
- “To keep a workforce that is updated with new tech skills. Also, keep our infrastructure updated as well.”
- “The biggest challenge we face is an aging workforce and a lack of available replacement workers with CDLs. We expect to have over 50% of our workforce retire in the next 5-to-10 years.”

Adopting Technology and Automation

- “Automation will create new jobs that will require new skills. We already train to respond to incidents that can happen in the [right of way] (Spills etc.). The jobs in the future will be very different than they are today. In my 40-year career I have seen the change in equipment and level of skill needed to perform has drastically changed and will continue to evolve (GPS etc.).”
- “Envision driverless vehicles becoming more used within this field for routine and dangerous aspects of the profession (snow plowing, attenuator, paint crews, etc.). Workers will need to be able to take limited output from control station and need to be able to discern that information and make decisions (for example, I can envision 1 computer operator monitoring and controlling multiple driverless trucks for snow plowing operations).”
- “Hoping a diverse future that entails or enables myself & others to have and sustain safe, mobile, well-paying transportation jobs, better/longer lasting materials and better use of technology and equipment and teamwork with others.”
- “Less personnel and more technology. GIS-based asset management and system efficiencies via new application methods.”
- “Greater demand for sustainability. More congestion in work zones. Better communication at all levels, state to county/county to city, to make sure all entities have a say in the best approach to development and maintenance of roadways. It can't be a one-way street.”
- “More automation with an emphasis on human over machine”
- “Semi-trucks are getting bigger and bigger which creates stress on our highway system. Technology including driverless vehicles will help with some of the issues we see on our highway system.”

Declining Budgets and Deteriorating Infrastructure

- “Our future is uncertain due to the decrease in state funding and its uncertainty.”
- “In our local area, it’s evident that a lot of money has been spent in the last 30 years to create some beautiful pavement that is now starting to see the end of its lifespan in a time when budgets are capped. It’s my duty to prioritize the reconstruction of these roads and complete as much as I can to maintain our infrastructure on a limited budget. It would be helpful if the political body was more aware of the maintenance aspect of their initial investments and how important it should be to include those considerations/costs in their initial decision-making processes.”
- “Money talks with transportation, any changes will need to accommodate the increasing demands on our systems. Long-term sustainable funding is paramount. Environmental

concerns are ever increasing but will yield to demand. Developing environmentally friendly methods with productive/affordable results is a goal of mine. We will be constantly evolving and learning."

- "We are very concerned because the condition of our bridges and roadways are not in good shape due to its age thus more maintenance is needed. The current environment with the budget for transportation and lack of resources to reconstruct our infrastructure is creating a big challenge for the state to maintain. Furthermore, our newer engineers are lacking the diverse background in surveying and construction to develop a solid foundation in understanding long-term maintenance on our roadways."
- "Providing good customer service with reduced funding and equipment"
- "All interesting topics but currently we are not looking quite that far ahead. We are more focused on maintaining what we have and continuing to upgrade areas that improve safety and the condition of the highways with the limited funding we have."
- "We have two to three part-time employees to help keep our roadways in drivable condition. Finances do not permit us to have full-time employees. Our maintenance of equipment is done by a local small business owner. We will continue to try to improve our drive road system in our rural town."
- "Unlimited highway maintenance needs on a limited highway maintenance budget."
- "How can we adequately maintain our infrastructure system with limited revenue streams?"
- "How to provide adequate services with levy limits in place."
- "Less money for maintenance/repair."
- "Low budgets for high budget demand"
- "Poor roads and bridges due to lack of funding & [Wisconsin Governor] Walker cuts."

Steady State with Evolving Changes

- "I do not expect to see much change in the way our operation runs. We are a small community with a limited budget making it very hard to prioritize what capital projects should be at the top of the list."
- "Continue same, daily general highway maintenance and summer resurfacing projects."
- "I am planning on creating a good maintenance infrastructure in my county, that will adapt to changes that occur due to technology, demographics, and public policy."
- "Highway maintenance will continue to evolve and change, and the future will look much different with the integration of technology into the operations."
- "I see a future in which continued and increased stresses will be placed on our infrastructure in terms of LOS [level-of -service], with waning resources to maintain them."
- "None of the above. We are in the process of trying to catch up after many years of neglect to our transportation system. So our plan to is to get our system back in order so we can focus in on some of the items that are listed above."
- "Simply maintaining current roads."
- "The immediate future is rapidly declining facilities and an unsupportive budget."
- "Usually in the reactive mode due to limitations in funding to support the infrastructure we currently have. Funding of capital improvements is at a level of once in 100 years = unsustainable. Primarily in the asphalt pavement preservation mode with little other ability to develop new technologies for the current transportation modes."

- “We are planning a 30+ year road life-cycle with 100 miles of road (up from 25). Pavement maintenance applications will increase. We anticipate adding 1 FT Level 2 Intermediate (Road Crew Employee) to our Road Department with increased development. We are a flat and efficient organization and will need to remain as such.”
- “We consistently work to keep our township roads in the best repair we can afford. In addition to using taxpayer monies, we apply regularly for all grants (county and state) that may be available. This year we will be doing a costly partial reconstruction on a portion of one our roads to mitigate future washout problems during heavy rains.”
- “One that is substantially the same as today with some advancements in technology, more environmental regulations, more governmental bureaucracy, and less interest in the transportation trades.”
- “To remain fluid with our operations and to efficient with our duties.”

Rebranding

Q128: Should we rebrand the highway maintenance occupation in the future?

This question had 99 responses. Most respondents (71 percent) said “No.”

Q129: Please share your ideas.

Many of the ideas discuss the Importance of Highway Workers or suggest alternative branding for highway maintenance. The following are specific comments:

- “Highway Maintenance impacts everyone's life on a daily basis, however, it is not a "glorified" career and does not get the acknowledgment it deserves.”
- “I like the technology or technician approach. Future workers need to have a better understanding of road maintenance techniques and tasks, may be problematic because to some extent their managers do not fully understand proper or best management approaches either.”
- “I think a lot of the focus of the position is winter plowing, but that is only half the year. More emphasis needs to be put on the non-winter tasks and associated skill sets needed. Also, I think more emphasis on decision making and other non-physical skills need to be promoted for these positions as almost all are not directly supervised on an hourly basis.”
- “Repair and replace existing infrastructure before we are overwhelmed.”
- “The public worker has been painted in a negative light over the past few budget cycles and media coverage. These are employees that are giving up countless hours of personal and family time to ensure our roads are clear and safe, especially during the winter season. Their work makes it possible for everyone to get to where they are going safely and keeps the economy moving.”
- “Yes as we move forward it is more than holding shovel. Our workers are talented, educated and community focused. Working daily on dangerous highways with up to date computer equipped equipment.”
- “We need to train and compensate workers to retain a skilled workforce. They need to know confined entry, trenching and excavating, equipment skills, equipment maintenance and repair.”
- “Identify future generation expectations.”

- “Well-paying jobs without a mountain of student loan debt. Today's norm is all [high school] graduates need to go to a 4-year university. Put more emphasis on the value of technical programs that support the construction and maintenance trades.”
- “With the younger workforce utilizing technology much more than the older workers this opens opportunities for highway maintenance that may not have been available before. If we can adjust our structure to incorporate more IT/GIS that will ultimately increase our efficiencies, we could tap a new sector of employee that would have never considered the highway maintenance field before.”
- “Needs better pay and they need people that know what they are doing to make decisions for the community.”
- “Infrastructure Technician”
- “Maintenance is important to everything, but it sounds like drudgery if you are considering it as a career. Maybe we should call it "infrastructure specialist".
- “Make them comparable to contractor highway works. Change public attitude toward county highway worker.”
- “Should be highway workers, maintenance is limiting.”
- “We need to work on rebranding to change the public perception. One of the stigmas is that highway workers are lazy, or don't work hard. This is obviously not the case at all. I believe we need more interaction with the public for them to understand what an essential and hard-working group of individuals we are.”
- “Should carry the same value as any other public safety employee.”
- “The brand should be respected as much as police and EMS.”

Recommendations

Public works employers and highway commissioners have an opportunity to create a pathway for workers through an apprenticeship that can be articulated for credit towards an associate degree. Further pathway development could be for the civil engineering technician occupation.

An apprenticeship in highway maintenance should include basic certifications such as the CDL and look to incorporate certifications in advanced technologies, such as drone piloting, intelligent transportation systems, geographic information systems, sustainability, and materials testing. Offering these certifications can also serve to attract new applicants to the sector.

In our outreach, we heard about productive county/high school partnerships and we learned of apprentices being hired, not as part of a Registered Apprenticeship program but in a “Grow Your Own” model of creating a talent pipeline, locally. Such practices should be scaled with an emphasis on skills and competencies that keep pace with technologies being implemented in urban areas.

Municipalities should develop partnerships to improve recruiting for Level 1 workers with agencies such as workforce development agencies, community-based organizations, and career and technical education (CTE) departments at local schools.

As a next step, MTWC will partner with the Wisconsin Department of Workforce Development to introduce the apprenticeship model to highway maintenance stakeholders. This workshop will take place in the Summer of 2018.

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Appendix – Wisconsin Highway Maintenance Workforce Survey 2017

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

Wisconsin Highway Maintenance Workforce Survey 2017

Q1. **Thank you for participating in this important survey!**

Your responses to the questions that follow will help the Midwest Transportation Workforce Center (MTWC) at the University of Wisconsin-Madison develop a career pathway for skilled careers in Highway Maintenance.

Your responses are confidential and will not be associated with you, personally. Results will be reported in aggregate form. Your participation is voluntary and you may skip any questions. However, your responses are crucial for our study to be successful. We estimate that it takes 30 minutes to complete this survey. You can take the survey all at once or in parts. Simply close the browser to exit the survey. Later, you can click the link to access it from where you left off.

If you have any questions or issues with the survey, please contact **Maria Hart** at maria.hart@wisc.edu.

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Midwest Transportation Workforce Center
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Q2. **What type of organization do you work for?**

- ○ County
- ○ City
- ○ Village
- ○ Town
- ○ State Department of Transportation
- ○ Private Highway Maintenance Contractor

Q3.

Highway Maintenance Jobs in Your Organization

In this section, we want to learn about employment statistics and job titles used in your organization for the various levels of highway maintenance workers.

For this survey we have identified 4 levels of workers:

- Level 1 - Entry
- Level 2 - Intermediate
- Level 3 - Senior
- Level 4 - Supervisor (Project Manager, Superintendent or Administrator)

Q4.
Level 1 - Entry

Level 1 highway maintenance work typically requires graduation from high school, or GED or equivalent experience. They work under close supervision and perform routine equipment operations and physical labor activities. They may operate equipment such as dump trucks, front-end loaders, tractors, motor graders, high reach excavators, and the support equipment such as air compressors, oil distributors, and pneumatic tools.

Does your organization employ Level 1 workers?

- ○ Yes
- ○ No

Q5.
In your organization, what job title is associated with the Level 1 worker?

For example: Highway Maintenance Worker 1

Q6.
Does a private sector contractor provide Level 1 highway maintenance duties for your organization?

- ○ Yes
- ○ No

Q7.
Please indicate contractor(s) organization name.

Q8.
Does a public sector organization provide Level 1 highway maintenance duties for your organization?

- ○ Yes
- ○ No

Q9.
Please indicate public sector organization name.
Example: Rusk County

Q10.
Some organizations have a combined or cross-trained workforce.

Do you have other job classifications, such as Diesel Mechanic 1, that perform Level 1 highway maintenance duties in your organization?

- Yes
- No

Q11.
Are any of these other job classifications required to perform highway maintenance duties?

- Yes
- No

Q12.
Please tell us what other job classifications are required to perform highway maintenance.

Q13.
Do any other job classifications within your organization volunteer to perform highway maintenance duties?

- Yes
- No

Q14.
Please tell us the other job classifications from which workers may volunteer to perform highway maintenance duties.

Q15. **In 2016, what was the total number of employed, permanent, full-time positions for ${q://QID126/ChoiceTextEntryValue}s in your organization?**

Q16.
In 2016, did you hire seasonal workers to perform Level 1 duties?

- ◯ Yes
- ◯ No

Q17.
During the winter season, about how many FTE Level 1 seasonal highway workers does your organization usually hire?

Q18.
During the summer season, about how many FTE Level 1 seasonal highway workers does your organization usually hire?

Q19. **Level 2 - Intermediate**

Level 2 highway maintenance work typically requires graduation from high school or GED or equivalent experience. This level also requires one to two years of experience operating heavy equipment and performing roadway maintenance. They work under moderate supervision and operate multiple gasoline and diesel powered construction equipment such as heavy bulldozers and power shovels as well as related heavy construction equipment exceeding four tons.

Does your organization employ Level 2 workers?

- ◯ Yes
- ◯ No

Q20.
In your organization, what job title is associated with the Level 2 worker?

For example: Highway Maintenance Worker 2

Q21.
Does a private sector contractor provide Level 2 highway maintenance duties for your organization?

- ◯ Yes
- ◯ No

Q22.
Please indicate contractor(s) organization name.

Q23.
Does a public sector organization provide Level 2 highway maintenance duties for your organization?

- Yes
- No

Q24.
Please indicate public sector organization name.

Example: Rusk County

Q25.
Some organizations have a combined or cross-trained workforce.

Do you have other job classifications, such as Diesel Mechanic 2, that perform Level 2 highway maintenance duties in your organization?

- Yes
- No

Q26.
Are any of these other job classifications required to perform highway maintenance duties?

- Yes
- No

Q27.
Please tell us what other job classifications are required to perform Level 2 highway maintenance.

Q28.
Do any other job classifications volunteer to perform Level 2 highway maintenance duties?

- Yes

- ○ No

Q29.
Please tell us the other job classifications from which workers may volunteer to perform Level 2 highway maintenance duties.

Q30.
In 2016, what was the total number of employed, permanent, full-time positions for ${q://QID128/ChoiceTextEntryValue}s in your organization?

Q31.
In 2016, did you hire seasonal workers to perform Level 2 duties?

- ○ Yes
- ○ No

Q32.
During the winter season, about how many FTE Level 2 seasonal highway workers does your organization usually hire?

Q33.
During the summer season, about how many FTE Level 2 seasonal highway workers does your organization usually hire?

Q34.
Level 3 - Senior

Level 3 highway maintenance work typically requires graduation from high school or GED or equivalent experience, plus four or more years of full-time experience in roadway maintenance. They work under limited supervision. They function as a crew leader for staff specializing in highway maintenance services and assist in the coordination of planning work schedules, providing leadership and guidance to crews, coordinating maintenance operations in the field, monitoring work performed, compiling crew work statistics, and documenting crew activities.

Does your organization employ Level 3 workers?

- ○ Yes
- ○ No

Q35.
In your organization, what job title is associated with the Level 3 worker?

For example: Highway Maintenance Worker 3

Q36.
Does a private sector contractor provide Level 3 highway maintenance duties for your organization?

- Yes
- No

Q37.
Please indicate contractor(s) organization name.

Q38.
Does a public sector organization provide Level 3 highway maintenance duties for your organization?

- Yes
- No

Q39.
Please indicate public sector organization name.

Example: Rusk County

Q40.
Some organizations have a combined or cross-trained workforce.

Do you have other job classifications, such as Diesel Mechanic 3, that perform Level 3 highway maintenance duties in your organization?

- Yes
- No

Q41.
Are any of these other job classifications required to perform highway maintenance duties?

- ○ Yes
- ○ No

Q42. **Please tell us what other job classifications are required to perform Level 3 highway maintenance.**

Q43.
Do any other job classifications volunteer to perform Level 3 highway maintenance duties?

- ○ Yes
- ○ No

Q44.
Please tell us the other job classifications from which workers may volunteer to perform Level 3 highway maintenance duties.

Q45.
In 2016, what was the total number of employed, permanent, full-time positions for ${q://QID132/ChoiceTextEntryValue}s in your organization?

Q46. **In 2016, did you hire seasonal workers to perform Level 3 duties?**

- ○ Yes
- ○ No

Q47. **During the winter season, about how many FTE Level 3 seasonal highway workers does your organization usually hire?**

Q48. **During the summer season, about how many FTE Level 3 seasonal highway workers does your organization usually hire?**

Q49. **Level 4 - Supervisor**

Level 4 highway maintenance work typically requires graduation from high school or GED plus experience equal to five or more years of full-time experience in highway/roadway maintenance, highway construction work, or highway materials inspection work. They are top-level supervisors of maintenance functions and supervise multiple locations within an assigned area of operations. They are often assisted by a Level 3 worker.

Does your organization employ Level 4 workers?

- ○ Yes
- ○ No

Q50. **In your organization, what job title is associated with the Level 4 worker?**

For example: Superintendent

Q51. **Does a private sector contractor provide Level 4 highway maintenance duties for your organization?**

- ○ Yes
- ○ No

Q52. **Please indicate contractor(s) organization name.**

Q53.
Does a public sector organization provide Level 4 highway maintenance duties for your organization?

- ○ Yes
- ○ No

Q54. **Please indicate public sector organization name.**

Example: Rusk County

Q55. **Some organizations have a combined or cross-trained workforce.**

Do you have other job classifications, such as Diesel Mechanic 4, that perform Level 4 highway maintenance duties in your organization?

- ○ Yes
- ○ No

Q56.
Are any of these other job classifications required to perform highway maintenance duties?

- ○ Yes
- ○ No

Q57. **Please tell us what other job classifications are required to perform Level 4 highway maintenance.**

Q58.
Do any other job classifications volunteer to perform Level 4 highway maintenance duties?

- ○ Yes
- ○ No

Q59. **Please tell us the other job classifications from which workers may volunteer to perform Level 4 highway maintenance duties.**

Q60. **In 2016, what was the total number of employed, permanent, full-time positions for ${q://QID130/ChoiceTextEntryValue}s in your organization?**

Q61. **In 2016, did you hire seasonal workers to perform Level 4 duties?**

- ○ Yes
- ○ No

Q62. **During the winter season, about how many FTE Level 4 seasonal highway workers does your organization usually hire?**

Q63. **During the summer season, about how many FTE Level 4 seasonal highway workers does your organization usually hire?**

Q64. **Total Number of Highway Maintenance Staff**

For the last calendar year 2016, what was the total number of full-time, permanent employees in the highway maintenance section of your organization?

Include Levels 1-4 and other staff beyond Level 4. Do not include clerical staff.
Please enter 0 to indicate that your organization does not have a highway maintenance staff.

Q65. **Total Number of DOT Highway Maintenance Staff**

For the last calendar year 2016, what was the total number of full-time, permanent employees in the highway maintenance section of your Region or Bureau?

Do not include clerical staff. Occupations within highway maintenance may include policy/planning analyst, highway maintenance engineer, landscape architect, GIS technician, surveyor, etc.

Q66.
Vacancies

In the last calendar year 2016, how many vacancies did your organization experience for Levels 1-4 ?

Q67. **DOT Vacancies**

In the last calendar year 2016, how many vacancies did your organization experience in your highway maintenance section of your Region or Bureau?

Do not include clerical staff. Occupations within highway maintenance may include policy/planning analyst, highway maintenance engineer, landscape architect, GIS technician, surveyor, etc.

Q68.
This year, in 2017, how many-full time, permanent positions will your organization need to fill for Levels 1-4?

Q69. **This year, in 2017, how many-full time, permanent positions will your organization need to fill in your highway maintenance section of your Region or Bureau?**

Do not include clerical staff. Occupations within highway maintenance may include policy/planning analyst, highway maintenance engineer, landscape architect, GIS technician, surveyor, etc.

Q70. 2016 Salaries

These next questions are about pay range and actual salaries for Levels 1 though 4 workers in the year 2016 in your organization.

Q71. Pay Range - Annual Salary

In 2016, what were the lowest and highest possible salaries, regardless of whether an employee is receiving the salary?

Example: 29000

	Lowest possible annual salary	Highest possible annual salary
${q://QID126/ChoiceTextEntryValue}		
${q://QID128/ChoiceTextEntryValue}		
${q://QID132/ChoiceTextEntryValue}		
${q://QID130/ChoiceTextEntryValue}		

Q72. Pay Range - Hourly Wage

In 2016, what were the lowest and highest possible hourly wages, regardless of whether an employee is receiving the salary?

Example: 15.00

	Lowest hourly wage	Highest hourly wage
${q://QID126/ChoiceTextEntryValue}		
${q://QID128/ChoiceTextEntryValue}		
${q://QID132/ChoiceTextEntryValue}		
${q://QID130/ChoiceTextEntryValue}		

Q73. Actual 2016 Salaries

In 2016, what were the actual lowest and highest salaries, paid to a current, full-time employee in your organization?

	Lowest actual annual salary	Highest actual annual salary
${q://QID126/ChoiceTextEntryValue}		
${q://QID128/ChoiceTextEntryValue}		
${q://QID132/ChoiceTextEntryValue}		
${q://QID130/ChoiceTextEntryValue}		

Q74. **Actual Average Salaries**

The actual average is the sum of the salaries for all employees reported in a particular classification divided by the same number of employees.

In 2016, what was the actual average salary for each level in your organization?

	Actual average salary
${q://QID126/ChoiceTextEntryValue}	
${q://QID128/ChoiceTextEntryValue}	
${q://QID132/ChoiceTextEntryValue}	
${q://QID130/ChoiceTextEntryValue}	

Q75. **Seasonal Worker Hourly Wage**

You indicated that you hired seasonal workers at the following level(s).

In 2016, what were the hourly wages?

Example: 15.10

	What was the lowest possible hourly wage for this level?	What was the highest possible hourly wage for this level?	What was the typical hourly wage offered to seasonal workers at this level?
Level 1-Entry			
Level 2-Intermediate			
Level 3-Senior			
Level 4-Supervisor			

Q76. Recruiting Highway Maintenance Workers

This section focuses on issues pertaining to recruitment of all highway maintenance workers, levels 1-4 or entry to supervisor level.

Q77.
Level 1 - Entry

Level 1 highway maintenance work typically requires graduation from high school, or GED or equivalent experience. They work under close supervision and perform routine equipment operations and physical labor activities. They may operate equipment such as dump trucks, front-end loaders, tractors, motor graders, high reach excavators, and the support equipment such as air compressors, oil distributors, and pneumatic tools.

Does your organization experience any problems filling Level 1 positions?

- ○ Yes
- ○ No

Q78.
Level 2 - Intermediate

Level 2 highway maintenance work typically requires graduation from high school or GED or equivalent experience. This level also requires one to two years of experience operating heavy equipment and performing roadway maintenance. They work under moderate supervision and operate multiple gasoline and diesel powered construction equipment such as heavy bulldozers and power shovels as well as related heavy construction equipment exceeding four tons.

Does your organization experience any problems filling Level 2 positions?

- ○ Yes
- ○ No

Q79. **Level 3 - Senior**

Level 3 highway maintenance work typically requires graduation from high school or GED or equivalent experience, plus four or more years of full-time experience in roadway maintenance. They work under limited supervision. They function as a crew leader for staff specializing in highway maintenance services and assist in the coordination of planning work schedules, providing leadership and guidance to crews, coordinating maintenance operations in the field, monitoring work performed, compiling crew work statistics, and documenting crew activities.

Does your organization experience any problems filling Level 3 positions?

- ○ Yes
- ○ No

Q80. **Level 4 - Supervisor**

Level 4 highway maintenance work typically requires graduation from high school or GED plus experience equal to five or more years of full-time experience in highway/roadway maintenance, highway construction work, or highway materials inspection work. They are top-level supervisors of maintenance functions and supervise multiple locations within an assigned area of operations. They are often assisted by a Level 3 worker.

Does your organization experience any problems filling Level 4 positions?

- ○ Yes
- ○ No

Q81. **Difficulties filling positions**

How difficult is it for your organization to fill Level 1 highway maintenance positions because...

	Not at all difficult	A little difficult	Somewhat difficult	Very difficult	Extremely difficult
... the applicant pool is small?	○	○	○	○	○
... there's a stigma associated with highway maintenance?	○	○	○	○	○
... applicant pool lacks soft skills.	○	○	○	○	○
... applicant pool lacks relevant work experience?	○	○	○	○	○
... applicants do not have a clean driving record?	○	○	○	○	○
... applicants do not pass a drug screen?	○	○	○	○	○
... applicants have a criminal record?	○	○	○	○	○

Q82. **Is there any other reason that makes it difficult for your organization to fill Level 1 highway maintenance positions?**

- ○ Yes
- ○ No

Q83. **Please tell us what other reasons make it difficult for your organization to fill Level 1 highway maintenance positions:**

Q84.
Recruitment Methods

How well have each of the following methods worked for your organization in recruiting Level 1 highway maintenance workers?

	Not at all	A little	Somewhat	Very well	Extremely well
Social Media such as Facebook or Twitter	○	○	○	○	○
Postings on your organization's website	○	○	○	○	○
Connection to technical college counselors	○	○	○	○	○
Veterans organizations or military connections	○	○	○	○	○
Connection to high school counselors	○	○	○	○	○
Wisconsin Workforce Websites such as WorkNET	○	○	○	○	○
Unions	○	○	○	○	○
Word of mouth	○	○	○	○	○

Q85. **Is there any other method that works well for your organization in recruiting Level 1 highway maintenance workers?**

- ○ Yes
- ○ No

Q86. **Please tell us about other recruiting methods that have worked for recruiting Level 1 workers.**

Q87. Applicant Pool Skills

How hard are the following skills to find when your organization is hiring Level 1 highway maintenance workers?

	Not at all	A little	Somewhat	Very	Extremely
Teamwork	○	○	○	○	○

	Not at all	A little	Somewhat	Very	Extremely
Equipment Operation Skills	○	○	○	○	○
Following Directions	○	○	○	○	○
Creativity	○	○	○	○	○
Critical and Analytical Thinking	○	○	○	○	○
Writing	○	○	○	○	○
Problem Solving	○	○	○	○	○
Customer Service	○	○	○	○	○
Communication/Interpersonal Skills	○	○	○	○	○
Computer Skills	○	○	○	○	○
Reading and Using Information	○	○	○	○	○

Q88.
When your organization is hiring Level 1 highway maintenance workers, how hard is it to find applicants who have…

	Not at all	A little	Somewhat	Very	Extremely
... a clean driving record?	○	○	○	○	○
... a CDL permit or license?	○	○	○	○	○
... a good attendance record?	○	○	○	○	○
... a driver's license?	○	○	○	○	○

Q89. **Retention**

How much do the following factors contribute to why highway maintenance workers in your organization leave?

	Not at all	A little	Somewhat	Quite a bit	A great deal
Other reasons? Please specify.	○	○	○	○	○
Highway workers are burned out due to excessive overtime hours	○	○	○	○	○

	Not at all	A little	Somewhat	Quite a bit	A great deal
Lack of career progression/promotion opportunities	○	○	○	○	○
Managers do not have the skills to foster good working conditions	○	○	○	○	○
Work is seasonal	○	○	○	○	○
Maintenance workers can find higher paying jobs using same skill set	○	○	○	○	○
Workers find it hard to learn or adapt to equipment innovations	○	○	○	○	○
Employees feel embarrassed. They associate the quality of roads as a reflection of their job.	○	○	○	○	○
Workers prefer a climate controlled environment than working outdoors	○	○	○	○	○
Lack of purpose or direction due to disconnect with leadership?	○	○	○	○	○
Diversity and inclusion issues contribute to why highway maintenance workers leave	○	○	○	○	○
There is a lack of support services to accommodate workers (i.e. childcare)	○	○	○	○	○
Entry-level workers are bored with the duties assigned to this level	○	○	○	○	○
There is a stigma associated with highway maintenance	○	○	○	○	○

Q90. **Please tell us more about other challenges your organization has had in finding skilled workers.**

Q91. Pathways of Level 1 Workers

We want to learn more about the path that your Level 1 highway maintenance workers have taken to get to their current jobs.

Currently, about how many of the Level 1 workers in your organization have the following kind of experience or education?

	Not at all	A little	Somewhat	Quite a bit	A great deal
Pre-apprenticeship program	○	○	○	○	○
Landscaping/grounds crew experience	○	○	○	○	○
Family/farm experience	○	○	○	○	○
Construction laborer experience	○	○	○	○	○
No work experience; they come straight from high school	○	○	○	○	○
Some technical college/technical college degree	○	○	○	○	○
Bachelor's degree	○	○	○	○	○
Truck driver. Short or long-haul experience	○	○	○	○	○

Q92. Age of Level 1 Workers

How old are the majority of your full-time, permanent, Level 1 workers?

	Age range of level 1 workers
Less than 20 years old	○
21-25 years old	○
26-30 years old	○
31-35 years old	○
35-40 years old	○
Greater than 41 years old	○

Q93. Training of Level 1 Workers

In this section, we want to learn about the training of Level 1 highway maintenance workers.

Q94. **How often are your Level 1 workers at your organization trained...**

	Never	Rarely	Sometime	Very often	Extremely often
... through conference workshops	○	○	○	○	○
... by on-the-job training (other than apprenticeship)	○	○	○	○	○
... in apprenticeship programs	○	○	○	○	○
... by in-house training before they start the job	○	○	○	○	○
... through self-study	○	○	○	○	○
... through web-based programs such as webinars	○	○	○	○	○
... some other way? Please specify:	○	○	○	○	○
... through simulators	○	○	○	○	○

Q95. **Who trains your Level 1 workforce?**

	Never	Sometimes	About half the time	Most of the time	Always
In-house staff trainers	○	○	○	○	○
Professional associations/organizations such as APWA, National Highway Institute, LTAP, etc.	○	○	○	○	○
Other organizations? Please specify:	○	○	○	○	○
Unions	○	○	○	○	○
Technical colleges	○	○	○	○	○
Equipment manufacturer representatives	○	○	○	○	○

Q96. **Please list the types of in-house training that your organization provides to Levels 1 - 4 workers. These can include safety, flagging, etc.**

Q97. **In your organization, do you require training for workers to move from Level 1 to Level 2?**

- ○ Yes
- ○ No

Q98. **Please indicate training your organization requires for workers to move from Level 1 to Level 2.**

Training 1	
Training 2	
Training 3	
Training 4	
Training 5	
Training 6	
Training 7	
Training 8	

Q99. **In your organization, do you require training for workers to move from Level 2 to Level 3?**

- ○ Yes
- ○ No

Q100. **Please indicate training your organization requires for workers to move from Level 2 to Level 3.**

Training 1

Training 2	
Training 3	
Training 4	
Training 5	
Training 6	
Training 7	
Training 8	

Q101. **In your organization, do you require training for workers to move from Level 3 to Level 4?**

- ○ Yes
- ○ No

Q102. **Please indicate training your organization requires for workers to move from Level 3 to Level 4.**

Training 1	
Training 2	
Training 3	
Training 4	
Training 5	
Training 6	
Training 7	
Training 8	

Q103.

Recruiting Workers into the State DOT

We would like to learn more about the highway maintenance staff in your agency. Occupations within highway maintenance may include policy/planning analyst, highway maintenance engineer, landscape architect, GIS technician, surveyor, etc.

Do you currently have a problem recruiting staff into the the Highway Maintenance Section in your organization?

- ○ Yes
- ○ No

Q104. **What three occupations or job classifications are the most difficult to fill?**

1.
2.
3.

Q105. **Would you consider any of these positions ${q://QID172/ChoiceGroup/AllChoicesTextEntry} as critical to carrying out the mission of highway maintenance in your organization?**

- Yes
- No

Q106. **Which occupation, is most critical to carrying out the mission of highway maintenance in your organization?**

- ${q://QID172/ChoiceTextEntryValue/1}
- ${q://QID172/ChoiceTextEntryValue/3}
- ${q://QID172/ChoiceTextEntryValue/6}

Q107. **What are the skills that make the ${q://QID192/ChoiceGroup/SelectedChoices} position critical to your organization?**

Q108. **Applicant Pool Skills in the State DOT**

Generally, how hard are the following knowledge, skills, and abilities to find when your organization is hiring highway maintenance staff?

	Not at all	A little	Somewhat	Very	Extremely
Customer Service	○	○	○	○	○
Scenario Development	○	○	○	○	○
Project Management	○	○	○	○	○
Critical and Analytical Thinking	○	○	○	○	○
Stormwater Management	○	○	○	○	○

	Not at all	A little	Somewhat	Very	Extremely
Asset Management	○	○	○	○	○
Diversity and Inclusion	○	○	○	○	○
Policy	○	○	○	○	○
Social Impact Knowledge	○	○	○	○	○
GIS	○	○	○	○	○
Writing	○	○	○	○	○
Communication/Interpersonal Skills	○	○	○	○	○
Financial	○	○	○	○	○
Environmental Regulations	○	○	○	○	○
Predictive Modeling	○	○	○	○	○
Performance Measurement	○	○	○	○	○
Safety	○	○	○	○	○
Big Data Analysis	○	○	○	○	○
Negotiation	○	○	○	○	○
Problem Solving	○	○	○	○	○
Creativity	○	○	○	○	○
Teamwork	○	○	○	○	○

Q109. Retention in the State DOT

Do you currently have a problem retaining highway maintenance staff in your Region/Bureau?

- ○ Yes
- ○ No

Q110. **Do any of the following factors contribute to why highway maintenance workers in your organization leave?**

	Yes	No
Managers do not have the skills to foster good working conditions	○	○
There is a stigma associated with highway maintenance	○	○
Other reasons? Please specify.	○	○

	Yes	No
Maintenance workers can find higher paying jobs using same skill set	O	O
Lack of career progression/promotion opportunities	O	O
There is a lack of support services to accommodate workers (i.e. childcare)	O	O
Diversity and inclusion issues	O	O
Workers find it hard to learn or adapt to equipment innovations	O	O
Political climate	O	O
Pursue different careers	O	O
Lack of purpose or direction due to disconnect with leadership	O	O
Lack of training	O	O

Q111. **How much do the following factors contribute to why highway maintenance workers in your organization leave?**

	Not at all	A little	Somewhat	Quite a bit	A great deal
» Lack of career progression/promotion opportunities	O	O	O	O	O
» Maintenance workers can find higher paying jobs using same skill set	O	O	O	O	O
» Workers find it hard to learn or adapt to equipment innovations	O	O	O	O	O
» There is a stigma associated with highway maintenance	O	O	O	O	O
» Diversity and inclusion issues	O	O	O	O	O
» Managers do not have the skills to foster good working conditions	O	O	O	O	O

	Not at all	A little	Somewhat	Quite a bit	A great deal
» Lack of training	○	○	○	○	○
» Lack of purpose or direction due to disconnect with leadership	○	○	○	○	○
» There is a lack of support services to accommodate workers (i.e. childcare)	○	○	○	○	○
» Political climate	○	○	○	○	○
» Pursue different careers	○	○	○	○	○
» Other reasons? Please specify.	○	○	○	○	○

Q112. **Are there any other reasons that makes it difficult for your organization to retain highway maintenance staff?**

○ Yes

○ No

Q113. **Please tell us what other reasons make it difficult for your organization to retain highway maintenance staff.**

Q114. **Technology Adoption in Highway Maintenance**

There are many emerging technologies that new workers will need to learn.

First, which of the following technologies are already in use in highway maintenance in your organization?

	Yes	No
Advanced equipment controls	○	○

	Yes	No
Internet of Things (IoT) applications - real time, remote monitoring of infrastructure through sensors	○	○
Geographic Information Systems (GIS)	○	○
Solar panels in the right of way and facilities	○	○
AVL Systems - fleet management and dispatching including system programming and operation	○	○
RWIS - Road weather information systems	○	○
3D printers	○	○
Cybersecurity	○	○
AVL (Automatic Vehicle Location) Systems - devices, vehicle, and equipment	○	○
Internet of Things (IoT) applications - remote monitoring of environmental habitat	○	○
Virtual reality	○	○
Augmented reality	○	○
Drones	○	○
Driverless vehicles	○	○
ITS I2V devices (infrastructure to vehicle)	○	○
Fiber optics and boxes in ROW	○	○
Advanced pavement materials for pavement repair	○	○
Blockchain	○	○
GIS-based Pavement Management System	○	○

Q115. **You mentioned that the following technologies are not currently used in highway maintenance.**

In how many years do you think would the following technologies be used in highway maintenance in your organization?

	Less than five years	Five to ten years	More than ten years
» Drones	○	○	○
» Advanced equipment controls	○	○	○
» Driverless vehicles	○	○	○
» 3D printers	○	○	○
» AVL (Automatic Vehicle Location) Systems - devices, vehicle, and equipment	○	○	○
» AVL Systems - fleet management and dispatching including system programming and operation	○	○	○
» Geographic Information Systems (GIS)	○	○	○
» GIS-based Pavement Management System	○	○	○
» Solar panels in the right of way and facilities	○	○	○
» Cybersecurity	○	○	○
» Blockchain	○	○	○
» Internet of Things (IoT) applications - real time, remote monitoring of infrastructure through sensors	○	○	○
» RWIS - Road weather information systems	○	○	○
» Internet of Things (IoT) applications - remote monitoring of environmental habitat	○	○	○
» Fiber optics and boxes in ROW	○	○	○
» ITS I2V devices (infrastructure to vehicle)	○	○	○

	Less than five years	Five to ten years	More than ten years
» Advanced pavement materials for pavement repair	○	○	○
» Virtual reality	○	○	○
» Augmented reality	○	○	○

Q116. **Please tell us about any other technologies that you think highway maintenance workers might use in the future.**

Q117. **Please provide commentary on new skills that a worker may need in the future.**

Q118. Workforce Challenges

Thinking about your highway maintenance workforce, what is your biggest challenge?

Q119. Your Career

Thinking about your career, please tell us about your pathway to the position you currently have. We are interested in how you were exposed to the field of highway maintenance, what education and training supports highway maintenance , and what previous jobs brought you to this career.

Q120.

Workforce Development Topics

In this section, we explore a number of topics associated with the Highway Maintenance Career Pathway.

Competencies of Highway Maintenance Workers

MTWC is developing a Highway Maintenance Competency Model that reflects the knowledge, skills, and abilities of today's worker. We are also identifying the knowledge, skills, and abilities (KSAs) that may be needed over the next 10-15 years. We are seeking individuals to review this effort for validation purposes.

Are you interested in reviewing a draft of the Highway Maintenance Competency Model and provide comments to us?

- ◯ Yes, please include me in this project.
- ◯ No, I am not able to participate at this time.

Q121. **Apprenticeships**

Apprenticeship is a proven model that helps employers retain workers over a period of training so that workers receive a credential. Apprenticeships can be designed to provide up-front training, or apprentices can work part of the week and attend training the rest of the week. Mentorship is one component of apprenticeship. At the end of the apprenticeship, workers are awarded a certificate that is recognized across the country.

In Wisconsin, the Department of Workforce Development awards the certificates. Apprenticeships have been historically popular in the construction sector, lately however, industries such as manufacturing, IT, insurance, and healthcare are developing apprenticeships for entry-level workers, to upskill their current employees, or to provide a credential for programs the employer is already doing such a rotational program, or, on-the-job training. Employers, both public and private sector can sponsor apprentices. In some cases, apprenticeships can count towards a degree.

Many occupations are apprenticeable.

How familiar is your organization with the apprenticeship model?

- ◯ Not at all
- ◯ A little
- ◯ Somewhat
- ◯ Very

- Extremely

Q122. **How interested are workers at your organization in pursuing credentials such as an apprenticeship?**

- Not at all
- A little
- Somewhat
- Very
- Extremely

Q123. **How much do you support developing an apprenticeship for workers in your organization?**

- Not at all
- A little
- Somewhat
- Quite a bit
- A great deal

Q124. **ACT National Career Readiness Certificate**

The National Career Readiness Certificate examination assesses an individual's skill level in three areas deemed critical for employability: Reading for Information, Applied Mathematics, and Locating Information. ACT, the organization that developed the college testing standard, researched over 16,000 occupations before developing these three WorkKeys® assessments for the NCRC.

Just as the ACT score indicates the college readiness of all students, the NCRC assesses the career readiness of all students and serves as a reliable predictor for workplace success of any applicant, student or adult. Thousands of private and public employers now ask for or require NCRC scores as part of the application process.

NCRC is awarded at four levels: Platinum, Gold, Silver, and Bronze. Each is an objective validation to employers anywhere in the U.S. that an individual has met or exceeded the necessary foundational skills for a percentage of the 16,000 occupations in the WorkKeys database. For example, a Gold certificate verifies that an individual has the necessary skills for 93% of occupations. An employer may use NCRC scores for baseline applicant screening; hiring and promotion decisions; and targeting employee training and development.
Many human resources offices use WorkKeys® assessments to screen applicants.
Source: Technology Center of Dupage

Have you heard of the National Career Readiness Certificate also known as the NCRC?

- Yes
- No

Q125. **How interested are workers at your organization in pursuing credentials such as the National Career Readiness Certificate?**

- ○ Not at all
- ○ A little
- ○ Somewhat
- ○ Very
- ○ Extremely

Q126. **How supportive would you be of developing an awareness of the National Career Readiness Certificate in your organization?**

- ○ Not at all
- ○ A little
- ○ Somewhat
- ○ Very
- ○ Extremely

Q127. **The Future of Highway Maintenance**

- What will the future transportation corridor look like?
- Will our pavements be storing or generating energy?
- Will sustainability and climate concerns change how we think about our transportation corridors?
- Will the impact of automation create new jobs that require different skills?
- Will the metrics used for transportation move beyond connectivity and pavement quality to health and human impacts to take into account road dust from tires, brake pads, and road surface wear?
- Will future highway decisions be made entirely though a sustainability lens?
- Will the future highway maintenance also maintain other horizontal infrastructure such as telecom?

- Will first responder duties be part of a future skillset?
- The jobs and the skills we may need to have in the future (15 years) may be very different than today.
- Like shared mobility, will the highway maintenance worker be a shared occupation?

There are many scenarios ahead of us.

What type of future are you planning for?

Q128. **Should we rebrand the highway maintenance occupation in the future?**

- ◯ Yes
- ◯ No

Q129. **Please share your ideas.**

Q130. Survey Report

Are you interested in receiving a survey report?

- ◯ Yes. Please send me the final report.
- ◯ No. I am not interested at this time.

Q131. Contact Information

Please indicate your name and contact information.

Name	
Title	
Organization	
Address	
City	
State	
Zip Code	
Email	

Q132. Thank you for your time.

For more information on this project visit, http://mtwc.org/initiatives/highway-maintenance-engineering-career-pathways/

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