

WisDOT Workforce Development and Readiness Project

Romila Singh, Ph.D.

Associate Professor, Lubar School of Business

Xiao Qin, Ph.D.

Professor of Civil Engineering and Director, UW-Milwaukee IPIT

Mark Gottlieb, P.E.

Associate Director, UW-Milwaukee IPIT

Nadya Fouad, Ph.D.

University Distinguished Professor
Kellner Chair of Educational Psychology, School of Education

**Institute for Physical Infrastructure and Transportation
University of Wisconsin-Milwaukee**

**WisDOT ID no. 0092-21-62
January 2022**



RESEARCH & LIBRARY UNIT

WISCONSIN DOT
PUTTING RESEARCH TO WORK

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. 0092-21-62	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Workforce Development Initiative WisDOT: Workforce Development and Readiness Project		5. Report Date January 2022	
		6. Performing Organization Code	
7. Author(s) Romila Singh, Ph.D.; Xiao Qin, Ph.D.; Mark Gottlieb, P.E.; Nadya A. Fouad, Ph.D.		8. Performing Organization Report No.	
9. Performing Organization Name and Address Institute for Physical Infrastructure and Transportation University of Wisconsin-Milwaukee Milwaukee, WI 53201		10. Work Unit No.	
		11. Contract or Grant No. 0092-21-62	
12. Sponsoring Agency Name and Address Wisconsin Department of Transportation Research & Library Unit 4822 Madison Yards Way Room 911 Madison, WI 53705		13. Type of Report and Period Covered Final Report January 2021-January 2022	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract The purpose of this project was to understand and analyze the nature of personnel gaps at the Division of Transportation System Development (DTSD) and offer recommendations on how best to address some of the gaps. The UWM-IPIT project team conducted gap analysis using a variety of methodologies: SWOT analysis, attrition analysis over time, areas of failed recruitments, assessments of mission critical activities performed in various regions and bureaus, the extent of current needs met by FTEs vs. consultants across regions and bureaus, analysis of benchmarking data obtained through interviews with peer DOTs. The cumulative results of all gap analyses identified a multitude of internal and external forces confronting DTSD and WisDOT, with staffing and workforce development challenges among the chief concerns. Recommendations were based on the assessment of key best practices, results of gap analysis, benchmarking information, and analysis of WisDOT organizational structure. Three broad recommendations were offered: (1) establish a team of workforce planning professionals to engage in annual/biennial workforce planning activities that are coordinated with the strategic planning process and engage multiple layers of leadership; (2) develop succession planning and knowledge management programs that are aligned with strategic workforce planning and development plans; (3) re-envision retention practices that are aligned with strategic workforce planning and development needs and focus on core competency training, establishing communities of practice, and career development programs.			
17. Key Words Workforce planning, development, readiness		18. Distribution Statement No restrictions. This document is available through the National Technical Information Service. 5285 Port Royal Road Springfield, VA 22161	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 91	22. Price

ACKNOWLEDGEMENTS

This study was conducted for the *Wisconsin Department of Transportation, DTSD*. This project was led by the UWM-IPIT team comprised of Dr. Romila Singh, Dr. Xiao Qin, Mr. Mark Gottlieb, and Dr. Nadya Fouad. The DTSD team was led by Mr. Jerry Mentzel, Mr. Scott Lawry, and Mr. Josh Dietsche. This project is a product of joint partnership between the UWM-IPIT and DTSD teams. The UWM-IPIT team gratefully acknowledges the extensive efforts and time dedicated by the DTSD team to facilitate the successful completion of this project. The UWM-IPIT and DTSD teams acknowledge and are grateful for the generous leadership and support provided by Ms. Rebecca Burkel and her team. The teams also acknowledge and express their appreciation to the DTSD Directors who participated in the study and contributed their insights as well as Mr. Randy Sarver who provided data and shared his perspectives. Finally, the teams appreciate the help provided by Ms. Xiaoxia Zhu and Ms. Megha Yadav who served as student project assistants.

Disclaimer

This research was funded by the Wisconsin Department of Transportation and the Federal Highway Administration under Project 0092-21-62. The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views of the Wisconsin Department of Transportation or the Federal Highway Administration at the time of publication.

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof. This report does not constitute a standard, specification or regulation.

The United States Government does not endorse products or manufacturers. Trade and manufacturers' names appear in this report only because they are considered essential to the object of the document.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iii
EXECUTIVE SUMMARY	vii
CHAPTER 1: INTRODUCTION	1
1.1 WORKFORCE PLANNING AND ITS ALIGNMENT TO ORGANIZATION STRATEGY	1
1.2 FHWA BEST PRACTICE RECOMMENDATIONS FOR WORKFORCE PLANNING AND STRATEGIC WORKFORCE PLANNING, WORKFORCE DEVELOPMENT FOR DOTs	3
Figure 1-1: FHWA Best Practices for Strategic Workforce Planning and Workforce Development	3
1.3 US DOT AND FHWA GUIDE TO STRATEGIC WORKFORCE PLANNING	5
1.4 WORKFORCE PLANNING AND WORKFORCE DEVELOPMENT ACROSS THE STATE DOTs	6
Figure 1-2: US DOT Who/What/Why, and How of Workforce Planning	6
1.5 ROLE OF WORKFORCE PLANNING FOR ORGANIZATIONAL STRUCTURES AND EFFICIENCY	7
Figure 1-3: McKinsey’s (2021) Operating Model Transformation	8
1.6 STRATEGIC WORKFORCE PLANNING FOR DOT TRANSPORTATION WORKFORCE	8
1.7 ORGANIZATIONAL STRUCTURES AND DESIGNS ACROSS STATE DOTs: WHAT WORKS AND WHAT DOES	10
1.8 COMMON DOT ORGANIZATIONAL STRUCTURES	11
1.9 SHIFTS IN DOT ORGANIZATIONAL STRUCTURE IN RESPONSE TO EXTERNAL FORCES	11
1.10 THE NEW “ORGANIZATIONAL IDEAL” STRUCTURE FOR DOTs	12
1.11 CONCLUSION	13
CHAPTER 2: METHODOLOGY	14
Table 2-1: Overview of the Approach Used for Workforce Gap Analysis at DTSD	15
2.1 SWOT ANALYSIS	16
2.2 SUMMARY OF STRENGTHS AND WEAKNESSES	17
2.3 SUMMARY OF OPPORTUNITIES AND THREATS: INTERNAL AND EXTERNAL TO THE DIVISION	21

Table 2-2: SUMMARY OF STRENGTHS AND WEAKNESSES	23
Table 2-3: SUMMARY OF OPPORTUNITIES AND THREATS.....	24
CHAPTER 3: WORKFORCE ANALYSIS: ATTRITION TRENDS, GAP ANALYSIS, CORE COMPETENCIES ASSESSMENT	25
3.1 Workforce Trends in the Transportation Sector.....	25
3.2 GAP ANALYSIS: ATTRITION TRENDS, FAILED RECRUITMENT, AND FTE UTILIZATION AT DTSD.....	26
3.3 DRIVERS OF ATTRITION AT DTSD: TRENDS – 2017-2020.....	28
Chart 3-1: Drivers of Attrition at DTSD: 2017-2020.....	28
Chart 3-2: Drivers of Attrition at DTSD: 2017.....	29
Chart 3-3: Drivers of Attrition at DTSD: 2018.....	29
Chart 3-4: Drivers of Attrition at DTSD: 2019.....	30
Chart 3-5: Drivers of Attrition at DTSD: 2020.....	30
3.4 COMBINED ATTRITION TRENDS ACROSS BUREAUS AND REGIONS: 2017-2020	31
Chart 3-6: Attrition by Bureau and Region: 2017-2020.....	31
3.5 FAILED RECRUITMENTS: ALL BUREAUS.....	32
Chart 3-7: Failed Recruitment Across the Bureaus: 2019-2020.....	32
3.6 FAILED RECRUITMENTS: ALL REGIONS.....	32
Chart 3-8: Failed Recruitment Across the Regions: 2019-2020.....	32
3.7 PILOT GAP ANALYSIS FOR ACTIVITIES TO MAINTAIN CRITICAL SKILLS IN-HOUSE: EXAMPLE DATA FROM THREE BUREAUS	33
Chart 3-9: Approximate Proportion of FTEs Fulfilling BOS Work Activities.....	33
Chart 3-10: Approximate Proportion of FTEs Fulfilling BHM Work Activities	34
Chart 3-11: Approximate Proportion of FTEs Fulfilling BTO Work Activities.....	35
3.8 WORKFORCE ANALYSIS UNDERSTANDING MISSION CRITICAL ACTIVITIES: STRATEGIC PATHWAYS CORE COMPETENCY SURVEY RESULTS	35
Chart 3-12: Range of Region Activities Recommended for Maintaining Internal Expertise	37
Chart 3-13: Range of Bureau Activities Recommended for Maintaining Internal Expertise	38
Chart 3-14: Importance of Mission Critical Activities vs Activities Recommended to be Retained Internally	39

3.9 ROOT CAUSE ANALYSIS	39
CHAPTER 4: BENCHMARKING AGAINST PEERS (INTERVIEWS WITH PEER DOTs).....	41
4.1 MINNESOTA DOT PRE INTERVIEW BACKGROUND INFORMATION FOR CONTEXT	41
4.2 MINNESOTA DOT: VIRTUAL TEAMS MEETING SUMMARY	43
4.3 MICHIGAN DOT PRE INTERVIEW BACKGROUND INFORMATION FOR CONTEXT	47
4.4 MICHIGAN DOT: VIRTUAL TEAMS MEETING SUMMARY	49
4.5 MISSOURI DOT PRE-INTERVIEW BACKGROUND INFORMATION FOR CONTEXT	55
4.6 MISSOURI DOT: VIRTUAL TEAMS MEETING SUMMARY	55
4.7 ANALYSIS AND IMPLICATIONS OF PEER DOT INTERVIEWS FOR WISDOT	59
CHAPTER 5: NEXT STEPS AND RECOMMENDATIONS	61
REFERENCES	65
APPENDIX 2: DTSD TEAM’S STRATEGIC PATHWAYS CORE COMPETENCY SURVEY	67
APPENDIX 3: ROOT CAUSE ANALYSIS FORMAT USED BY THE DTSD TEAM.....	70
APPENDIX 4: MDOT HOUSE AND MICHIGAN AUGMENTED DELIVERY PROGRAM	71

EXECUTIVE SUMMARY

The purpose of this project was to understand and analyze the nature of personnel gaps at the Division of Transportation System Development (DTSD) and offer recommendations on how best to address some of the gaps. The project utilized the literature and research from NCHRP, TRB, NAE, OPM, US DOT, FHWA, McKinsey, and SHRM to identify some of the major trends and best practices in the area of workforce planning that undergirded the project. In keeping with some of the principles and best practices identified in the literature, the project team conducted gap analysis using a variety of methodologies: SWOT analysis, attrition analysis over time, areas of failed recruitments, assessments of mission critical activities performed in various regions and bureaus, and the extent of current needs met by FTEs vs. consultants across regions and bureaus. In addition, gap analysis was complemented by benchmarking data obtained through interviews with peer DOTs. The project scope was modified based on the unavailability of certain types of requested data and other changes brought on by the insights generated at different stages of project administration.

The cumulative results of all gap analyses helped to identify a number of internal and external forces confronting DTSD and WisDOT, with staffing and workforce development challenges among the chief concerns. These challenges are significant and ongoing and merit the dedication of increased resources to address them. The costs of not doing so are likely to be far greater than the costs of the resources that would be invested in addressing them. The results also revealed a number of areas in which the DTSD and WisDOT are well equipped to overcome these challenges and chart a stronger path forward. The recommendations were based on the assessment of key best practices, results of gap analysis, benchmarking information, and analysis of WisDOT organizational structure. The recommendations include:

- Establish a team of workforce planning professionals to engage in annual/biennial workforce planning activities that are coordinated with the strategic planning process and engage multiple layers of leadership. The team will be responsible for carrying out some of the essential activities associated with this function.
- Develop succession planning and knowledge management programs that are aligned with strategic workforce planning and development plans.
- Re-envision retention practices that are aligned with strategic workforce planning and development needs. Retention plans need to include a focus on core competency training, establishing communities of practice, and career development programs for better retention of professionals, especially those vulnerable to leaving for other organizations. Greater use of available federal funds for investing in workforce development efforts should also be considered.
- There was not enough data to support the recommendation of any specific organization structure, but guidance was provided on parameters to consider when evaluating different structure models and the change process to follow if/when restructuring occurs.

CHAPTER 1: INTRODUCTION

Personnel gaps brought on by either failure to hire, promote, or replace vacant posts or different forms of attrition (e.g., retirements, resignations, firing) are best understood through the lens of workforce planning. Before proceeding with the discussion on various facets of workforce planning, what it entails, and the major trends and best practices in the area, it is important to first describe the meaning and definition of the term.

1.1 WORKFORCE PLANNING AND ITS ALIGNMENT TO ORGANIZATION STRATEGY

Definitions

According to the US Office of Personnel Management (OPM):

“Simply stated, workforce planning is the process of ensuring that the right people are in the right place, and at the right time to accomplish the mission of the agency. More specifically, workforce planning is a systematic process for identifying and addressing the gaps between the workforce of today and the human capital needs of tomorrow.” (p. 1, 2008)

We would add an additional feature to that widely accepted classic definition:

*“Workforce planning is the process of ensuring that the right people, **with the right skills and competencies**, are in the right place, and at the right time to accomplish the mission of the agency.”*

Over the years, the definitions have evolved to emphasize a strategic component and direction to workforce planning as reflected in the definitions below:

“Workforce planning is an activity intended to ensure that investment in human capital results in the timely capability to effectively carry out an organization's strategic intent.”
(Emmerichs, Marcum, & Robbert, Rand Corporation, 2004)

“Companies need a strategic plan to ensure that they get the right people in the right jobs.”
(Harbert, SHRM, Dec. 2020)

The Need for Workforce Planning

Workforce planning is a systematic process of identifying and addressing the gaps in knowledge, skills, and abilities between the current workforce and future talent needs. Workforce planning is vital to counteract the rapidly changing external environment characterized by changes in technology, workforce demographics, socio-political and legislative dimensions, and shifting needs, aspirations, and talents of the current workers.

Workforce Planning: Pre-Pandemic and Now:

According to an article by Harbert in the SHRM (“Workforce Planning in the Age of Covid”, Dec. 2020), before the Covid-19 pandemic, most organizations omitted the strategic component in workforce planning and instead used it merely as a “headcount exercise.” In addition, about 40-50% of organizations lacked a strategic workforce plan where the organization’s strategy and

mission was tied to workforce planning, “one that takes care of employees, increases their engagement, and builds skills and capabilities for workers and the organization.”

A May 2020 survey conducted by McKinsey of 190 Chief Human Resource Officers across the country summarized the challenge of (strategic) workforce planning in the age of Covid-19 pandemic: “We’ve had five years of change in five months,” (Hancock & Schaninger, 2020). The pandemic has led many organizations to take a step back and evaluate their approach to workforce planning, especially in the context of optimizing its alignment to organizational strategy. Indeed, 33% of the survey respondents planned to spend more time and resources on workforce planning.

Both the SHRM article (Harbert, 2020) and the McKinsey report (Hancock & Schaninger, 2020) documented not merely the changes in time, resources, and intent regarding workforce planning before and during the pandemic, they also captured a fundamental shift in perspective and scale. In particular, the McKinsey report recommended that for strategic workforce planning to be effective in the current and post-Covid era of work, it needs to be re-envisioned to reflect three key steps:

- **Scouting** which entails the institution developing a single vision of its future and the total value of the future, including identifying the most important skills gaps by looking at future events – not just extrapolating from the past internal trends, and then analyzing its readiness to address the gaps and attain its vision. Gap analysis is critical to benchmarking against peer competitors’ capabilities and analyzing internal talent development efforts. As stated by Hancock et al., (2020) “there is no point in enduring the expense of retraining and redeploying expensive talent if the newly skilled employees walk out the door because they think that competitors are more attractive.” (p. 4)
- **Shaping** involves redesigning work to meet the demands of new workforce trends and technologies and developing the infrastructure for a ‘talent accelerator’ to acquire and deploy the talent to the most mission critical roles. It is worthwhile for the organization to involve employees and teams to identify obstacles to efficiency, innovation, and collaboration. This ‘job crafting’ also gives employees more incentives to remain with the organization over the long term.
- **Shifting** includes scaling up the talent development process agency wide to ensure that any gains are not relegated to a single division or business unit. Talent development also needs to focus on upskilling, reskilling and modernizing the talent development functions that are reflective of the best practices in adult learning.

In addition, other workforce planning experts argue that for the workforce planning exercise to be effective, organizations must focus their efforts on:

- “Forming more-varied, short-term scenarios as part of their long-term planning and revisiting those plans more often.
- Improving their ability to easily and quickly retrain, cross-train and redeploy staff.
- Reimagining how they recruit, retain and redeploy employees in a world where more people work remotely and the use of independent contractors is growing.

- Emphasizing benefits to protect the emotional, mental and physical health of their employees.” (SHRM, Dec. 2020)

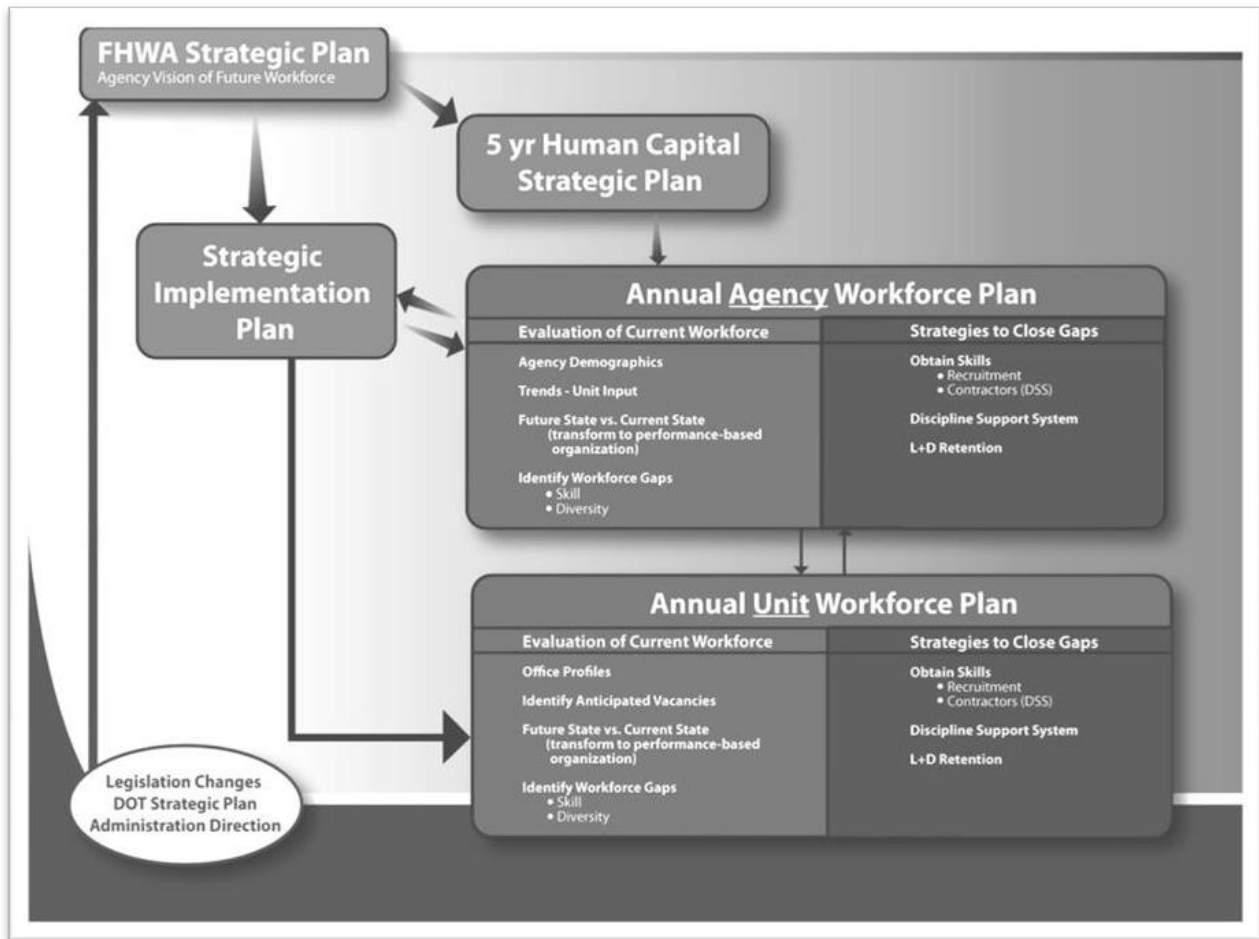
1.2 FHWA BEST PRACTICE RECOMMENDATIONS FOR STRATEGIC WORKFORCE PLANNING AND WORKFORCE DEVELOPMENT FOR DOTs

In 2014, the Government Accountability Office (GAO) worked with the Office of Personnel Management (OPM) to release six best practices for FHWA:

1. Align workforce planning with strategic planning and budget information
2. Involve managers, employees, and other stakeholders in planning
3. Identify critical occupations, skills, and competencies to analyze workforce gaps
4. Develop strategies to address workforce gaps
5. Build capacity to support workforce strategies
6. Monitor and evaluate progress

The six best practices were represented in varying degrees in the peer DOTs interviewed by the UWM-IPIT team. The following figure illustrates the six best practices in action at the FHWA:

Figure 1-1: FHWA Best Practices for Strategic Workforce Planning and Workforce Development *Source: FHWA. Report No.: MH-2014-058*



Source: FHWA

Best Practice 1: Align Workforce Planning with Strategic Planning and Budget Formulation

One of the foundational best practices is to integrate workforce planning with key agency-wide strategic planning and implementation efforts. The first step is to develop a strategic human capital plan that integrates workforce planning into a strategic management plan for the agency. According to the Federal Office of Personnel Management (2005), a strategic human capital plan is: “the method by which an agency designs a coherent framework of human capital policies, programs, and practices to achieve a shared vision integrated with the agency’s strategic plan. Implementation of the strategic human capital plan is a key step in an agency’s progress to build a highly effective, performance-based organization by recruiting, acquiring, motivating, and rewarding a high-performing, top quality workforce. The plan becomes the roadmap for continuous improvement and the framework for transforming the culture and operations of the agency” (p. 1). The second key step in this process is to integrate the strategic human capital plan with the budget development process so that staffing levels and vacancies can be aligned with budgetary constraints.

Best Practice 2: Involve Managers, Employees, and Other Stakeholders in Planning

It is important to approach workforce planning as a routine, yet strategic annual activity in which managers, directors, and their leadership teams routinely get together to determine workforce planning issues that have emerged. These include understanding future workforce needs, identifying skill gaps in mission critical occupations, and using data based tools to identify which vacant positions should be filled with the same qualifications and responsibilities, or modified to better meet the agency’s goals and business needs. The planning process needs to be conducted across all bureaus and regions and not just at the top leadership levels.

Best Practice 3: Identify Mission Critical Occupations, Skills, Competencies, and Analyze Workforce Gaps

There are three key recommendations for creating a sustainable and strategic workforce plan through the lens of mission critical occupations and skillsets. First, it needs to be a multi-year, agency-wide plan that uses data to compile workforce changes over time across the different units, bureaus, districts, and regions. Second, it needs to identify mission critical positions/occupations and skills that have the highest anticipated turnover through either retirements, resignations, or internal movement. Finally, workforce gaps need to be identified for mission critical positions/occupations and competencies by conducting a “supply analysis” (e.g., data on workforce profile, turnover analysis, leadership pipeline, etc. and “demand analysis” (e.g., identifying future essential competencies, additions/deletion of programs, technology changes, legislative requirements, and budgets, etc..

Best Practice 4: Identify Strategies to Address Workforce Gaps

Before identifying ways to address workforce gaps, it is important to prioritize which gaps need to be addressed in the near-term, mid-term, or long-term. The choices for addressing workforce gaps typically fall into three categories: “buy, build or rent.” Talent can be bought through recruitment of employees to meet projected shortfalls in skills needed to accomplish mission critical goals. Recruitment efforts should be focused on addressing the most significant identified gaps. Gaps can also be addressed by building talent from within, through succession planning, knowledge management, comprehensive investment in training and development, revised career

planning and mobility that provides incentives for lateral movement, job rotations, on-the-job coaching and so on. The final option to consider in addressing workforce gaps is to rent talent through outsourcing to outside consultants, contractors, or other temporary workers. This option needs to be exercised carefully so as not to lose the ability to maintain control over the means, methods and outcomes of the work being performed. The agency's goals for diversity and inclusion should also be considered when addressing workforce gaps.

Best Practice 5: Build Capacity to Support Workforce Strategies

Building capacity to support the implementation of workforce strategies can be accomplished through quarterly and annual meetings between field staff and leadership teams to review the "build," "buy," or "rent" decisions and appropriate adjustments to be made. It is imperative that there are trained staff/professionals in workforce planning and human capital management at these meetings to *continually* coordinate, guide, and support the efforts to close the skills gaps.

Best Practice 6: Monitor and Evaluate Progress

The strategic workforce implementation plan should include tools for monitoring and measuring progress toward meeting workforce goals at the agency's business unit level. Metrics and analytics need to be used to measure progress toward achieving strategic and operational human capital targets identified in the plan. Typical metrics include average-time-to fill a vacancy, failed recruitments, turnover rates, depth of bench strength, diversity, and employee satisfaction surveys. Staff assigned to monitor and evaluate the progress should coordinate among themselves to set goals, identify strategies to calibrate their efforts, and lay the groundwork for the next planning cycle. The OPM has released a standard for workforce management known as Human Capital Framework and there are a variety of tools, templates, and guidelines available on their website for use by workforce planning staff and directors.

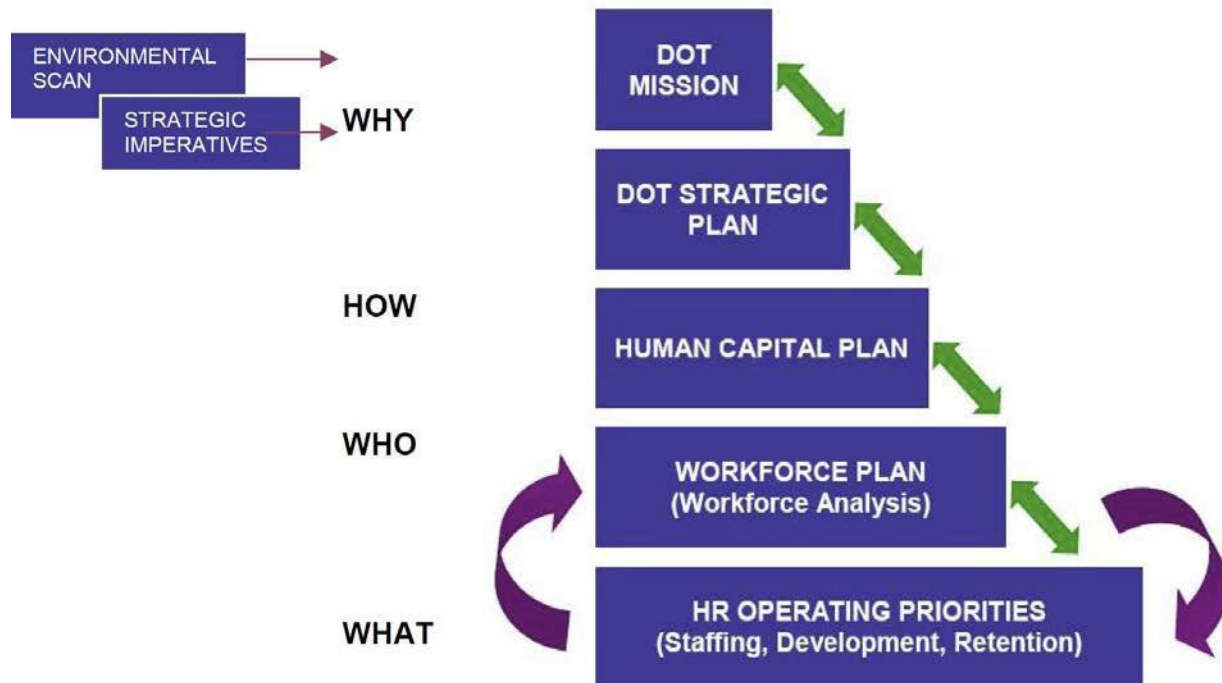
1.3 US DOT AND FHWA GUIDE TO STRATEGIC WORKFORCE PLANNING

In addition to the best practices highlighted by the FHWA, the US DOT released a workforce planning and human capital management guide in 2008 that has become the widely accepted tool for all activities subsumed within this practice (link to report: <https://www.opm.gov/policy-data-oversight/human-capital-management/hiring-reform/wfpguide.pdf>). Figure 1-2 outlines the strategic drivers of the workforce planning process and the continual feedback loops between DOT's strategic mission and subsequent workforce planning.

Specifically, the DOT's Mission sets out the foundation and context of the reasons for a specific workforce plan. It answers the question "WHY" do we need to undertake this effort and highlights the strategic imperatives that are driving the mission.

The DOT's strategic plan provides a vital blueprint and a critical next step for "HOW" workforce planning will be carried out: the resources required to address the identified priorities in improving the workforce, performance management systems, and overall culture to successfully accomplish the stated mission.

Figure 1-2: US DOT Who/What/Why, and How of Workforce Planning



While the DOT mission and strategic plan set the stage with the WHY and the HOW of workforce planning, it is imperative that the agency develops a specific Human Capital/Workforce Plan that identifies “WHO” will be needed to fulfill the DOT mission and strategic plans. Finally, this plan needs to explicitly identify WHAT of human capital management in terms of what specific programs that are currently funded or will be funded require what type of a “talent inventory.” This “talent inventory” needs to depict the current status of workers and their skills and competencies, anticipated turnover, projected attrition trends, and “talent shopping list” that reflects which positions will be staffed internally or externally with the same or different competencies.

1.4 WORKFORCE PLANNING AND WORKFORCE DEVELOPMENT ACROSS DOTs

The NCHRP (2019) commissioned a team to conduct an extensive survey and case study analysis to research the workforce planning and development efforts at all the state DOTs (link to the report: <https://www.trb.org/Publications/Blurbs/179878.aspx>). Out of the 50 state DOT leaders that received the survey, 45 completed the survey. The results revealed that workforce planning and development is not approached cohesively at all state DOTs and it is fairly disconnected in some of them. Three state DOTs reported not tracking any workforce planning. In addition, the operationalizations used for workforce planning and development differed among the DOTs. In general, workforce planning was operationalized as relating to human resource forecasting and filling positions with new skills. Likewise, the operationalization of workforce development varied and was most frequently associated with the agency’s focus on technical skills building. A number of workforce development programs were reported including courses for credit (most frequent), apprenticeships, mentorships, job shadowing/cross-

training/job rotation. Some DOTs also offered various types of tuition or paid leave arrangements for education.

One of the more interesting findings to emerge from this survey was the emphasis on “power” and “hard” skills that state DOTs need their workforce to possess in the next 10 years. The “power” skills included leadership, negotiation, critical thinking, problem-solving, teamwork, creativity, flexibility, conflict resolution, communication, and emotional intelligence. Out of these, leadership was the most frequently cited, suggesting the need to incorporate leadership training into current and future workforce preparation programs. The “hard” skills included a focus on technology, programming, quantitative analysis, and data science. Among these skills, a focus on technology related skills was the most cited requirement for the future workforce. The respondents noted that managerial and leadership training currently offered by their agencies is not adequate and needs to be improved. Some DOTs also mentioned that certain private sector workforce development programs worth ‘importing’ were a consideration of workforce pipeline issues, project management, apprenticeships, and mentoring. Compensation was noted as the most important reason why the well-trained transportation workforce left the DOTs.

A telling quote from a March 2021 report by the Corporation for Skilled Workforce (Good & Buford, 2021) summarizes the huge investment required for US employers to rethink their workforce development programs.

“After 40 years of declining investments in workforce development, building this ecosystem to include the components workers urgently need will not be cheap. We estimate that this set of recommendations will require \$70 billion per year to fully fund — \$50 billion for education and training, \$10 billion for career navigation and other supportive services and \$10 billion for badly needed infrastructure that has received little attention (research and development, technology, professional development, improved labor market information and more). Making that investment would move the U.S. from being one of the lowest per capita investors in workforce development into the mainstream of what is happening in advanced nations worldwide.” (p. 2)

1.5 ROLE OF WORKFORCE PLANNING FOR ORGANIZATIONAL STRUCTURES AND EFFICIENCY

A recent McKinsey survey of more than 1,300 senior leaders across the nation identified three factors (among a total of twelve factors) that exercised an enormous influence on organizational structures and operational efficiencies: governance, culture, and workforce planning.

Governance referred to the “the structure, authority, and membership of bodies that make critical decisions about the direction of the organization and how it is run.”

Culture included factors that are indicative of “the organization’s health, particularly its ability to align, execute, and renew itself faster than its competitors.”

Workforce planning was reflected in “the organization’s approach to ensuring it has the resources, capabilities, and capacity required to deliver value.” The survey concluded that organizations that prioritized these three areas in terms of improving their practices, stood to reap

the maximum benefits in terms of changes to their operational and organizational efficiencies. The figure below illustrates all the best-practice indicators that contributed to operational efficiencies.

Figure 1-3: McKinsey’s (2021) Operating Model Transformation



Source: Operating Model Transformation: Not all elements are created equal. D. F. Dobru, C. Hewes, P. Simon, and T. Welchman, McKinsey, Sept. 20, 2021

1.6 STRATEGIC WORKFORCE PLANNING FOR DOT TRANSPORTATION WORKFORCE

Echoing the findings of the McKinsey survey (2021) was Deputy Commissioner of Alaska DOT, Ms. Amanda Holland, who is the Chair of the Commission studying leading workforce planning and management practices across select DOTs as part of the AASHTO/NCHRP Domestic Scan Program. In a preview of her team’s findings, Ms. Holland framed workforce planning and management as critical tasks for an organization’s success and efficiency. She likened workforce management to the branches of the tree that gives life and shape to an organization’s structure that is purposefully rooted in its strategy. In a presentation at the AASHTO/NCHRP US Domestic Scan Program conference 20-68 A-D (June 7, 2021), Ms. Holland recommended the following key steps to follow in linking strategic planning with workforce planning in developing a strategic workforce plan for their DOT:

Align with the agency’s strategic direction by performing SWOT analysis and risk assessment. It is critical for the agency to engage in these two activities as a foundation for developing/modifying their strategic direction.

Conduct Organizational Design Review in order to identify all role designations and identify areas of above average success where the agency could realize cost and/or productivity savings or greater efficiency.

Define Current State of Work, Workforce, and Workplace by analyzing retirement, turnover, and retention data. This should also include an analysis of internal factors such as organizational culture and education and skills development.

Identify Future State of Work, Workforce, and Workplace by focusing on top workforce and industry trends and disruptors impacting the agency's future. This should also include an analysis of external factors such as pending legislation, new technologies, and shifting societal priorities.

Perform Gap Analysis between current and future states by prioritizing the organization's business and workforce needs. This should also include an analysis of the gap between the current and desired future state.

Develop Strategies to address identified gaps by developing recruitment and retention programs, succession planning activities, learning and development events, etc. to address the priorities and activities identified in the gap analysis. Employees need to be engaged at all levels.

Document and Implement the Strategic Workforce Plan (SWP) and identify areas with the greatest impact. It is important to identify champions across the organization in order to facilitate successful implementation of the SWP.

Monitor, Evaluate, Report, and Refine the SWP, which is a living document, that will reflect the outcomes and results from its various elements. The results need to be broadly reported to solicit feedback and also to get buy-in for continued implementation.

The NCHRP research led by Ms. Holland also stressed that her team did not find a "one size fits all" strategy for workforce planning and management. She emphasized that each DOT will need to follow the above recommended steps in order to create its own SWP and then implement the SWP using the best practices in change management. In addition, the Ms. Holland's team recommended that peer exchanges and different technology tools were useful in initiating and continuing the implementation of the workforce management plan. Finally, she stressed the importance of having metrics in place to measure the success of the SWP plan.

Ms. Holland's research found that workforce planning needed to be approached as an asset management plan with an emphasis on business value analysis, metrics on cost of investment in hiring, retaining, and developing talent. In this context, she stressed that employees' developmental readiness to fulfill specific work tasks may be a better predictor and more useful approach than performance management. In addition, she emphasized that the diversity of current and future workforce should also be a central element of the SWP plan. The workforce management plan should identify retention strategies for the current workforce. In this context, competency modeling can assist with both recruiting and providing career mobility opportunities for current employees. Finally, agency leadership played a critical role in facilitating the development and implementation of a workforce management plan by laying the groundwork for involving employees across all levels in the creation and implementation of the SWP plan.

1.7 ORGANIZATIONAL STRUCTURES AND DESIGNS ACROSS DOTs: WHAT WORKS AND WHAT DOESN'T

Research and analysis commissioned by the NCHRP (2012) provided a comprehensive review of the different organizational structures that characterized state DOTs, and how a rapidly changing environment had impacted how they adapted their structures in response to those changes. In the ten years since the publication of this report, the types of forces that would trigger any organizational design or structure changes appear to be as relevant now as they ever in 2012.

The report emphasized the need for state DOT leaders to understand the multitude of forces acting on the agency before deciding whether, how much, and what type of organizational change (or restructuring) they needed to pursue. The following quote summarized this approach:

“Despite considerable change over the last fifteen years, DOT organizational design thinking continues to evolve. In particular, the current economic climate and associated shortage of resources is driving agencies to replace a call for ‘strategic management’ with an emphasis on thinking about DOTs’ challenges in terms of private sector ‘change management’ practices that necessitate organizational restructuring to survive and succeed in today’s difficult environment.” (p. 1)

Organizational Restructuring and Forces Buffeting the DOTs

The NCHRP report summarized the results of a survey of 27 state DOT leaders and interviews with 15 of them. WisDOT was one of the survey respondents. The survey results revealed that five types of forces have typically confronted all state DOTs in varying degrees:

Pressure to do more with less. These pressures were unfolding while agency’s work roles were growing, staffing challenges were mounting (with attrition, failed recruitments, salary freezes, and stagnant compensations), and pressures to outsource were increasing. These pressures have forced DOT leaders to examine ways to reduce costs, re-examine what services and products to provide, and how to provide them.

Demands for performance accountability have grown tremendously and were impacting DOT organizational structures. Changes in performance management were being used to manage the organization direction of the agency and this trend may increase even further based on legislative actions at both the state and federal level.

An emphasis on improved project delivery was fundamentally reshaping how state DOT leaders approach organizational change and restructuring. This emphasis was enacted through actions that broke down silos and streamlined processes to improve project delivery.

Revenue shortfalls have forced state DOT leaders to rethink their roles and organizational structures to meet business objectives. Revenue shortfalls caused by aging infrastructure, growing congestion, fluctuating economic conditions, and increased fuel efficiency, have put pressure on transportation agencies to reimagine what services and products to provide and how to provide them most efficiently.

Importance of agency credibility with policy makers, specific stakeholders, and the public has increased in importance to ensure their continued support for DOTs workforce development and organizational change efforts.

1.8 COMMON DOT ORGANIZATIONAL STRUCTURES

The NCHRP (2012) highlighted the common dimensions that characterized the state DOTs organizational structures. The dimensions varied across a continuum and reflected the following:

Silo-based versus workflow-based DOTs. Most DOTs relied on a functional organizational design with separate groupings or ‘silos’ for various activities that were further divided by specific skillsets with work passed over the wall to the next silo. This type of a structure was characterized by a top-down management system that maintained control over all the groupings. In contrast, work-flow based organizations were characterized by a team-based approach where employees with diverse skillsets were held accountable for final product delivery. Very few DOTs had this type of a work-flow based structure. Between these two extremes was a mixed approach called the matrix structure that shared features from both silo and work-flow based organization structures.

Centralized versus decentralized DOTs: In centralized DOTs the headquarters controlled and performed most non-construction and maintenance functions. Resource and authority were centralized versus being distributed to multiple regions or districts. In decentralized DOTs, the regional or district office maintained more control and decision-making power over design, communication, fleet management, and public engagement.

In-house versus outsourced DOTs: In traditional state DOTs, there was a greater reliance on in-house staff to perform most agency functions except for construction. In contrast, state DOTs that relied on outsourcing maximized the use of private contractors, consultants, and other public or private sector partners to carry out or support the agency’s functions.

The report highlighted that many DOTs were experimenting with horizontal or matrix structures with decentralized decision-making that made use of new communication technologies and each DOT leader was taking a unique path that matches the unique challenges that their agency is confronting.

1.9 SHIFTS IN DOT ORGANIZATIONAL STRUCTURE IN RESPONSE TO EXTERNAL FORCES

Three broad trends were reported in this arena as DOT leaders responded to different change forces acting on their agencies:

A shift toward hybrid silo/workflow based organizational designs that promote nimbleness, efficiency, and innovation. The results of the study on 27 out of the 52 DOT leaders surveyed revealed that most DOTs viewed their structures as being either functional or “hybrid leaning functional” and were likely to move toward workflow-based structures in the future to better respond to the millennial generation’s preferences toward more collaborative work culture, greater empowerment, and more ‘nimbleness.’ Transition toward workflow-based structures was

evident in the creation of multi-disciplinary teams, cross-functional project managers, and reframing agency missions to be more reflective of this team and workflow-based culture.

A shift toward re-centralizing some key functions in order to ensure efficiency, consistency, and refocus on the core mission. The results of NCHRP (2012) study revealed that the emphasis on decentralization was waning and many DOTs were moving toward selectively recentralizing command related functions such as policy, administrative, and communications functions while decentralizing project delivery and moving it closer to the customer.

There was increased interest in outsourcing in order to respond to fiscal pressures and this trend was likely to continue. The DOTs surveyed in the NCHRP 2012 report noted that the leaders were “concerned about the implications of aggressive outsourcing due to its potential impacts on succession planning, retaining core knowledge/expertise, and cost effectiveness.” (p. 4) Pressures to balance in-house expertise and outsourcing was keenly felt by DOT leaders and some of the ways they responded to this pressure was by maintaining in-house ‘baseline capabilities,’ while outsourcing non-core functions or in areas beyond the baseline, and in functions that utilized the private sector’s unique skillsets and bench strength. The benefits of outsourcing noted included the ability to respond to headcount reductions, more accessible, and broader workforce, administrative flexibility, and potential performance gains.

1.10 THE NEW “ORGANIZATIONAL IDEAL” STRUCTURE FOR DOTs

The NCHRP study revealed that in response to the numerous pressures buffeting the DOTs, the leadership was refocusing their missions and reinventing themselves to be reflective of the “new organizational idea” that was characterized by:

Reduced Agency Size: Downsizing and flattening of organizational hierarchies was creating smaller, leaner, and more nimble DOTs.

Refined Mission: One of the more important shifts that has occurred because of all the pressures was the redefinition of DOT’s philosophy in implementing its mission from “yes we can” to “doing less with less.” This entailed focusing resources on critical functions while outsourcing or eliminating non-core functions.

Diversified Services Delivery Strategies: There was a greater emphasis on using outsourcing and privatization to streamline project and program delivery strategies to be faster, more efficient and cost effective.

Performance Focus: There was an increased emphasis on improving performance, transparency, and accountability to weather the fiscal and other pressures confronting their agencies and building/maintaining their credibility.

Improved Risk Management: There was an increased emphasis on using comprehensive risk management approaches at the enterprise, program, and project levels to better manage their operations.

The report concluded that for any organizational adaptation to succeed, it is imperative for the CEO and senior leadership to lead the change efforts by communicating simply, clearly, and

powerfully the needs and goals for any organizational change/adaptation. The change efforts should be anchored in the agency's unique culture and nature, its unique legal, institutional, and legislative parameters, and the mandate for initiating and implementing the change. The change efforts should be team-based and inclusive.

1.11 CONCLUSION

This chapter provided an overview of the definitions and distinctions between workforce planning and workforce development activities. Particular emphasis was paid to delineating the topic of strategic workforce planning and the steps involved in creating and implementing such plans at state DOTs. The chapter provided a brief overview of the key literature on the importance of undertaking workforce planning as a tool for addressing the skills and staff shortage, and effective implementation of recruitment and retention strategies. The chapter highlighted best practices from both the private sector and the FHWA. In addition, it provided an overview of the key results from an NCHRP commissioned analysis of the status and reach of DOTs workforce planning and development activities. Finally, the literature review provided an overview of the different organizational structure options that DOT leaders can consider as they devise options for addressing the various forces confronting their agencies. The literature review laid the groundwork for the SWOT and gap analyses and interviews with peer DOTs.

CHAPTER 2: METHODOLOGY

The project was conducted by the UWM-IPIT team in close partnership with the DTSD team that was charged with the task of providing various inputs to fulfill the stated objectives.

Throughout the duration of the project the UWM-IPIT research team met regularly with the DTSD team to discuss new guidance, inputs, review the progress of what had been accomplished, and recalibrate strategies based on the availability of information.

Broadly, the project followed the contours of the best practices identified by the OPM for FHWA and highlighted in Chapter 1. These best practices were modified to suit the purposes of the project as follows:

1. Align workforce planning with strategic planning and budget information
 - a. Used DTSD's Guiding Principles and Philosophies (GPP) Document to identify the key elements that aligned with the agency's strategic plan. In the absence of an existing workforce plan for DTSD, the UWM-IPIT team used this project as an opportunity to provide some inputs related to the elements identified as necessary components for DTSD to review.
2. Involve managers, employees, and other stakeholders in planning
 - a. The DTSD team served an additional role as unofficial bridge between the UWM-IPIT team and the Bureau and Region Directors throughout the project by providing the perspectives and inputs from Directors and other stakeholders. Their perspectives were incorporated primarily for analyzing workforce gaps.
3. Identify critical occupations, skills, and competencies to analyze workforce gaps
 - a. There were three parts to this effort: first, a quantitative and qualitative SWOT analysis was conducted to identify (workforce) gaps with regard to a number of factors. The quantitative portion entailed surveying all DTSD Directors for their perspectives and summarizing the major trends based on their assessments. The qualitative portion entailed using the SWOT analysis to facilitate discussions on the themes with them.
 - b. The DTSD team developed and conducted a survey as a sample approach to identify some of the mission critical activities within each bureau and region through their "core competency survey." In addition, DTSD team undertook a root cause analysis that evaluated the root causes of the strengths, weaknesses, opportunities and threats and core competency survey results. The team quantified the extent to which the root causes for the observed factors identified through SWOT core competency survey results could be attributed to organizational structure, process, system, people, the core values in the GPP, and the three distinct themes of the division's mission.
 - c. Workforce gap analysis also took the form of analyzing turnover data from 2017-2020, failed recruitments for 2017-2020, and limited gap analysis which captured the importance of skills needed to be maintained in-house as they related to different activities.
4. Develop strategies to address workforce gaps:

- a. Suggestions based on data collected from the gap analysis, sample root cause analysis, and benchmarking information obtained from interviews with three peer DOTs were used to identify recommendations for developing a workforce plan.
 - b. Literature review provided the foundation for recommending evidence-based strategies.
 - c. Interview data from three peer DOTs was used to compare and contrast with WisDOT and suggest additional options to address workforce gaps.
5. Build capacity to support workforce strategies
 - a. This was beyond the specified scope of this project.
 6. Monitor and evaluate progress
 - a. This was beyond the specified scope of the project.

The following table provides an overview of the approach used in this project and the sources of data used to implement the modified best practice guidelines.

Table 2-1: Overview of the Approach Used for Workforce Gap Analysis at DTSD

Activity	Inputs Used	Outputs	Participants
Information for Workforce Planning	<ul style="list-style-type: none"> • DTSD’s Guiding Principles and Philosophies Document • Literature review 	Served as the basis for SWOT and other analyses	<ul style="list-style-type: none"> • DTSD Team • UWM-IPIT team
Workforce Gap Analysis	<ul style="list-style-type: none"> • SWOT analysis • Attrition analysis over time • Failed recruitments • Gap analysis: Skills to be maintained in-house • Core Competency Analysis • Root Cause Analysis 	Foundation for Suggested Recommendations	<ul style="list-style-type: none"> • DTSD Team • DTSD Directors for SWOT, Core Competency and Root Cause Analysis • Data and inputs from DOA • UWM-IPIT Team
Recommended Strategies to Address Workforce Gaps	<ul style="list-style-type: none"> • Interviews with Peer DOTs • Results of SWOT, gap, and core competency analysis • Literature Review 	Recommendations for consideration by AO’s team	<ul style="list-style-type: none"> • DTSD Team • UWM-IPIT Team

2.1 SWOT ANALYSIS

Strengths, Weaknesses, Opportunities, and Threat (SWOT) Analysis is a tool developed by the Harvard Business School in the 1920s to analyze case studies. It is widely used by both private and public sector organizations to identify strategic issues and to develop strategies to proactively address them. As stated by the Panagiotou (2003), the

“SWOT analysis is concerned with the analysis of an organization’s internal and external environment with the aim of identifying internal strengths in order to take advantage of its external opportunities and avoid external (and possible internal) threats, while addressing its weaknesses.” (p. 8)

The SWOT analysis is a vital step in understanding the nature of the forces confronting the organization and the gaps that are important to address. The data captured from the SWOT analysis is an important input in the creation of a strategic workforce plan and the strategic workforce planning process. The UWM-IPIT research team used guidance and input from the DTSD team to develop questions for the SWOT analysis.

The categories that were used to assess the strengths and weakness were:

- Communication/collaboration
- Staffing
- Performance Management
- Training and Development
- Resource Allocation
- Additional/miscellaneous factors

Method

An online Qualtrics survey was developed to solicit responses from all DTSD Directors on whether they viewed a specific attribute as a strength, weakness, opportunity, or threat and determine the priority in addressing them. The survey link was sent by the UWM-IPIT team to all DTSD Directors. The survey was anonymous and the responses were aggregated to provide an overview of the major strengths, weaknesses, opportunities, and threats as well as the high, medium, and low priority areas to address. The SWOT summary is in Tables 2-2 and 2-3.

Before reporting the results of the quantitative portion of the SWOT analysis, it is important to mention that each factor could be rated both as a strength and a weakness. Likewise, each factor could be rated as both an opportunity and a threat. The following analysis of the results highlights only those factors which were reported by *at least 50 percent of respondents* as a strength, weakness, opportunity, or a threat. Likewise, top priority areas to address are noted for those that have been endorsed by *at least 50% of the respondents*.

Results

A summary table of the key SWOT factors is provided at the end of this chapter.

2.2 STRENGTHS AND WEAKNESSES

Summary of Strengths and Weaknesses: Communication, Collaboration, and Relationships

There were several notable areas of strengths and weaknesses identified by the respondents with regard to communication, collaboration and relationship. Quality of relationships and good collaboration between the AO's office and the different bureau and regions was cited a strength. In addition, while consistency in communication between the functional areas, geographical regions, and from the AO's office to different bureaus/regions was viewed as a strength, the communication *flows* between/across Divisions, and between front line decision-makers to policy-makers and implementors and from policy-makers to implementors were cited as a weakness. Inadequate communication flows may also be reflected in the lack of clarity in individual and collective decision-making accountability.

Priority Areas to Address

This is the only category which garnered a large number of high-priority areas to address with at least 50% of the respondents indicating its importance and need for prompt action. Topping the list is the need to develop better clarity in individual and collective accountability for decision-making. 70% of respondents viewed this as a high-priority area to focus on so that everyone knows which person/teams are accountable for each decision. The quality of relationships within the Division, and with stakeholders was cited by 58%-63% of respondents as warranting a need for immediate action. Further, communication flows and collaboration between the AO and the bureaus/regions, and between policy-makers and implementors, figured prominently as top areas to address in the immediate term by 50%-60% of the respondents. Finally, aligned with communication flows and collaboration, 55% of the respondents cited a need to focus on addressing decision-making transparency and better efforts to get buy-in from within/across levels and divisions. Overall, there is a strong foundation built on solid relationships, good communication, and collaboration but clearly, it is not enough to sustain, and more efforts should be dedicated toward improving the overall quality of communication flows, increasing transparency, accountability, and collaboration between the different business areas.

Summary of Strengths and Weaknesses: Staffing Factors

On the whole, there were more areas of weaknesses than strengths with regard to staffing factors assessed in the survey. The strengths cited included the adequacy of skills to meet project requirements and availability of technology infrastructure that enabled employees to accomplish their tasks efficiently. Turnover, staff unwillingness to move/relocate to different geographical work locations, and inadequate staff retention plans were identified as major weakness that likely reflected in another reported weakness, which is overstaffing/understaffing in certain locations. Juxtaposed with these factors was a great deal of emphasis on accommodating staff preferences in assigning tasks that aligned with their geographical locations, which was cited as a strength by respondents. However, accommodating employees' geographical preferences appeared to be constraining the Division from meeting its staffing and retention plans. All these factors appeared to be hurting the Division's efforts to successfully and efficiently meet its business needs. Adding to this combination of staffing concerns, is the uncertainty and lack of consensus

about the role that consultants should play as the Division charts its path forward in response to changes.

Priority Areas to Address

Three factors were listed as high-priority areas by at least 50% of respondents: turnover in key positions that impacts efficiency in fulfilling work/project requirements (79% of respondents), appropriateness of employee skills within divisions to accomplish assigned tasks and fulfill project work/requirements (58% of respondents), and consensus about the role that consultants should play in fulfilling the Division's mission (53% of respondents). Two other areas were listed as medium priority: focus on telework capabilities such as technology/IT to accommodate staff preferences for meeting work goals (58% of respondents) and focus on Bureau and Region-specific staff retention plans in the medium term (53% of respondents). As is evident, there was some but not full correspondence between the weaknesses identified in staffing factors and the urgency/immediacy of the need to attend to addressing them. For example, even though staff reluctance to move to different geographical locations was cited as a weakness by all the respondents, it was not noted as either a top or a medium priority area to address. Similarly, over/understaffing concerns did not make it to a top/medium priority list warranting any action.

Summary of Strengths and Weaknesses: Training and Development Factors

Overall, there were more weaknesses than strengths in this category. The majority of the respondents cited availability and clarity of opportunities and paths for career development as strengths. However, when these strengths are juxtaposed with the lack of succession plan as a major weakness, the message is clear that there is much work to be done in this area. Succession planning is closely tied to retention efforts and good career development. In addition to succession planning, three training areas were identified as not being responsive enough to changing work roles, skills, tools, and requirements. Inadequate training can undermine the efforts of the agency to efficiently fulfill its objectives.

Priority Areas to Address

It appears that there is no one-to-one correspondence in the weaknesses identified by the respondents and the immediacy of the priorities to address these weaknesses. While succession planning was highlighted by 100% of the respondents as a major weakness, one of the top two high priority areas to be addressed as reported by 68% of the respondents was the need for appropriate staff skill sets currently available to oversee consultant work. Likewise, 68% of the respondents cited the current availability of adequate training for front-line decision-makers on core skills as a high priority area that needed to be addressed. Another high-priority area that needed to be addressed as highlighted by the 58% respondents was the current availability of adequate training to develop people for 'step-up' roles. Current state of succession planning and opportunities currently available to advance within/across Division(s) were cited as being high priority areas to address by 53% and 56% of the respondents respectively.

Summary of Strengths and Weaknesses: Performance Management

Overall, there were more strengths than weakness noted by the survey respondents with regard to performance management. Chief among them was the culture of performance management that fostered new ideas and innovation. The strong culture was backed by solid processes that emphasized efficiency in fulfilling work tasks and ensured frequent performance reviews were administered across all levels. In addition, respondents generally endorsed that employees were valued and recognized for their contributions. However, the recognition and appreciation for good performance and/or innovation didn't take the form of meaningful financial incentives. In fact, lack of incentives tied to good performance along with poor clarity of which performance measures really mattered could erode the culture of performance management that the Division has worked hard to create and nurture. Even though these were not cited as overwhelming top priorities by the respondents, it is highly recommended that the Division make this an important priority area to address.

Priority Areas to Address

There was no one area that at least 50% of the respondents picked as a high-priority area to address. One area that came close to being endorsed by half the respondents was with respect to clarity about which performance measures really mattered. 42% of the survey respondents cited this as a top priority. Several other areas that emerged as medium priority focus areas to address were the emphasis being placed on efficiency in fulfilling work/project requirements, strengthening the culture of trying out new ideas/innovation, and finally, improving the nature of the constructive performance feedback given to employees.

Summary of Strengths and Weaknesses: Resource Allocation

There are more strengths than weakness in this category of resource allocation and it manifested in various ways from equitable allocation of IT and financial resources to adequacy of technology and IT for accomplishing work tasks. The only notable exception was the equitable allocation of staffing resources which was cited as a major source of weakness for the Division.

Priority Areas to Address

None of the factors were cited as being a high-priority area to address by the majority of the respondents. Close to half of the respondents (47%) endorsed equitable allocation of staff resources as being a high priority area to address. Several areas were cited as medium range priority areas to address such as equitable allocation of financial resources (68% said it was a medium range priority) and equitable allocation of IT and other technology resources (63% said it was a medium range priority). Given the continued interest in the equitable allocation of different types of resources as an important area to address, it would imply that this will be an ongoing focus area for leadership to keep in mind.

Summary of Strengths and Weaknesses: Additional Factors

The overall picture points to consistency being a major source of weakness for the Division. That manifested in several ways ranging from consistency in understanding distinctions between

guidance and policy language to staffing practices, organizational structure, and tools used to ensure consistency in process and products. The one bright spot with regard to consistency was that respondents perceived that there were opportunities for flexibility and innovation in the pursuit of consistency within the Division.

Priority Areas to Address

None of the factors emerged as high priority areas to address. The highest priority factor cited by less than half of the respondents (42%) was with regard to fine-tuning organizational structure to ensure consistency in process and products. Several areas emerged as medium-priority factors to address such as staffing practices to ensure consistency in process and products (58% said it was a medium-range priority) and opportunities for flexibility and innovation to pursue consistency within the division (58% said it was a medium-range priority). Two additional factors garnered more than 50% of endorsement as a medium-range priority factor to address: balance between consistency and flexibility and adequacy of tools to ensure consistency (both were cited at 53%).

Summary of Strengths and Weakness Across All Categories

An overall portrait that emerge from the assessment of strengths and weaknesses across multiple categories is that the Division has a solid foundation built on quality relationships, close collaborations, good communications, a culture built on efficiency, performance management, and encouragement of innovative ideas, clear and transparent paths for career development and opportunities for mobility and an equitable allocation of various resources to enable employees to fulfill their work/project requirements and strive for excellence, efficiency, and consistency. The assessment also reveals that this is a pivotal time for the Division as the number of weaknesses identified across multiple areas have the potential for overshadowing and perhaps even undermining employees' efforts to successfully fulfill the Division's goals and objectives. With myriad challenges facing the Division ranging from uneven/inefficient communication flows, high turnover, inadequate staffing, retention, and succession plans, inadequate training in response to changing work, skill requirements, and technology, and lack of performance-related incentives and recognition, the Division risks losing ground and momentum as it confronts different opportunities and threats both from external and internal sources. The top priority areas to address didn't fully line up with the identified weaknesses which in and of itself is something that merits further examination and discussion.

2.3 OPPORTUNITIES AND THREATS: INTERNAL AND EXTERNAL TO THE DIVISION

A variety of factors, both internal and external to the division or agency, were used to assess whether they were perceived as opportunities or threats.

Summary of External Opportunities and Threats

The opportunities presented in the external environment in the form of emerging technologies, relationships with external stakeholders (e.g., regulatory agencies, industry partners), demographic changes, and regulatory pressures outnumbered the threats posed by the tight labor market, state and legislative climate, and weather/climate related factors that impact infrastructure resilience. This presents an optimistic assessment of various external forces as opportunities to harness in order to address any challenges using the strengths identified in the previous section. However, inadequate or untimely response to addressing the weaknesses in light of the threats posed by the external forces, may constrain the agency in efficiently accomplishing its mission and objectives.

Priority Areas to Address

There are three high priority areas that warrant a need for immediate action.

The ability to successfully recruit people with the requisite skills, competencies, and degrees was the highest priority factor cited by 84% of the respondents. This was in keeping with the weaknesses related to turnover, staffing challenges, limited staff willingness for geographical mobility, and the agency's priority to use recruitment as a potential tool to address some of these staffing challenges. In addition, addressing challenges posed by the state and legislative climate was also cited by 74% as an important area to address. There was also a recognition that while there was a favorable and positive perception of the WisDOT, this was still cited as a high-priority area to address.

Summary of Internal/External Opportunities and Threats

Cumulatively, there are significant number of opportunities presented within the internal and external environment for the division to capitalize on as it charts its future. In contrast, there are few significant threats for the division to overcome, and those threats when they converge, can retard the progress that is made. The threats posed, such as attrition and maintaining a balance between internal expertise and outsourcing, are not insurmountable, especially in the context of numerous opportunities, strengths, and other resources identified in these analyses. In addition, the opportunities and threats identified present important inputs, and reinforce the need, for the development of a comprehensive workforce plan for the division.

Priorities to Address

Several of the factors cited as internal threats were listed as top priorities to address. One of the top areas cited was the need to ensure competitiveness in total compensation to attract the right talent. This was a top high-priority area as reported by 89% of respondents. The importance of maintaining the appropriate balance between in-house and outsourced work was cited by 89% of

respondents as another high priority area that needed to be addressed. A close second priority area (84%) was the need to address attrition and turnover in the agency. Staff training, professional development, and adequate opportunities for promotion were also top priorities identified by 69%-78% of respondents. Finally, the need to have good workload management practices and professionally trained staff for managing projects was endorsed as a high priority area needing attention by 56%-58% of the respondents.

Table 2-2: Summary of Strengths and Weaknesses (Highest Priority Items in RED)

	Strengths	Weaknesses
Communication, collaboration and relationships	<ul style="list-style-type: none"> • Quality of relationships • Collaboration between regions/bureaus • Collaboration with AO • Consistency of communication 	<ul style="list-style-type: none"> • Clarity of accountability for decisions • Communication between implementers and policy makers • Communication across divisions
Staffing	<ul style="list-style-type: none"> • Technical infrastructure • Geographic flexibility • Adequacy and fit of skills 	<ul style="list-style-type: none"> • Turnover in key positions • Unwillingness of staff to relocate • Lack of bureau and region-specific retention plans • Geographic staffing imbalance • Lack of consensus on consultant roles
Training and development	<ul style="list-style-type: none"> • Opportunities for advancement • Clarity of career development and promotional paths • Adequacy of training for step-up roles 	<ul style="list-style-type: none"> • Lack of divisional succession planning • Lack of appropriate skills to oversee consultant work • Training for job changes, changing demands, or new tools/methods
Performance management	<ul style="list-style-type: none"> • Culture of performance improvement • Frequency of reviews • Emphasis on efficiency • Culture of innovation • Recognition of innovators 	<ul style="list-style-type: none"> • Lack of incentives tied to performance • Clarity on which performance measures matter most • Lack of constructive feedback to employees
Resource allocation	<ul style="list-style-type: none"> • Adequacy and equitable allocation of technology and financial resources 	<ul style="list-style-type: none"> • Inequitable allocation of staff
Additional factors	<ul style="list-style-type: none"> • Opportunities for flexibility and innovation • Support for diversity, equity and inclusion efforts 	<ul style="list-style-type: none"> • Lack of clarity in policy vs. guidance language • Balance between consistency and flexibility • Inconsistent in process and products • Inadequate tools to attain consistency

Table 2-3 Summary of Opportunities and Threats

	Opportunities	Threats
External	<ul style="list-style-type: none"> • Emerging technologies/tools • External relationships (LPAs, regulators, industry) • Changing demographics • Stakeholder perceptions of WisDOT • Regulatory/compliance pressures 	<ul style="list-style-type: none"> • Labor market factors • Legislation changes • Environmental factors
Internal	<ul style="list-style-type: none"> • Promotion and Professional development • IT infrastructure, support and data management • Recruiting strategies • Staff training for project and workload management 	<ul style="list-style-type: none"> • Balance between in-house and outsourcing • Attrition, turnover and retirements

CHAPTER 3: WORKFORCE ANALYSIS: WORKFORCE AND ATTRITION TRENDS, GAP ANALYSIS, CORE COMPETENCIES ASSESSMENT

3.1 WORKFORCE TRENDS IN THE TRANSPORTATION SECTOR

According to a joint report released by the U.S. Departments of Transportation, Education and Labor, the transportation industry will be adding 417,000 skilled and semi-skilled job openings from 2012-2022 with the highest percentage of jobs being created in transit and ground passenger transportation. The openings will be concentrated in the West coast, the Gulf coast, the Upper-Mid Atlantic, several mountain states and the Midwestern states. The reason for these extensive job openings is the expected growth in these geographical areas, retirements, and turnover in the transportation industry, all concurrently taking place during this period. In the context of retirements, data shows that 53% of the current workers are 45 years or older and replacing these workers will be highly challenging. Also, turnover rates as high as 95% for large truckload fleets and 90% for small fleets (as per the American Trucking Association reports, 2014) further aggravates the situation.

The joint report mentioned that 4.6 million new workers will have to be trained by the employers to fill the gap. This gap creates provides extensive job opportunities in transportation sector particularly for the skilled and semiskilled workers. However, one issue highlighted in the report poses a significant challenge: there was a huge gap in the demand for and supply of highly skilled workers. For instance, there were 68% more projected job openings than the proportion of students enrolled in educational programs relating to transportation occupational groups. Another reason for this demand-supply gap was the underrepresentation of minorities in the transportation sector. According to the data, women were highly underrepresented throughout the transportation industry with only 10% women in railroad and 11% in highway construction areas. Similarly, African-Americans and Hispanics were also highly underrepresented in jobs that required higher skills and offered better pay and career growth opportunities. One way of combating this poor representation of women and under-represented minorities is by increasing the number of Career and Technical Education programs of study. These programs begin in high school and continue into postsecondary education or apprenticeship and provide the foundational and early occupational skills training needed in skilled occupations. For example, the National Network for the Transportation Workforce (NNTW) Career Pathways Initiatives have devised programs aligned with Registered Apprenticeship programs to reach a large number of people who can be trained and provided access to these high-demand jobs. It is through these types of trainings that millions of Americans can “punch their tickets to the middle class.”

Diversity in the Transportation Workforce

One of the major concerns of the American Association of State Highway and Transportation Officials (AASHTO) was the increased demand of skilled workers particularly in State DOTs. But with limited number of people choosing transportation-related careers and significant underrepresentation of key groups such as women and minorities, the transportation industry in United States is facing a lot of staffing challenges. According to the 2017 report by Mineta Transportation Institute (MTI) at San Jose State University, women accounted for less than 15%

of the total transportation workforce in United States. Women were underrepresented in numerous areas in transportation such as technical roles, construction and engineering. There were a couple of key factors that led to this underrepresentation. First, some scholars reported that the underrepresentation may be on account of lack of career interest in transportation (Agrawal & Dill, 2008), few role models in the industry (Rivera et al., 2007) and negative perceptions of the industry such as gender barriers and lack of flexibility (Dainty et al., 2004).

As per the “Women in Transportation Playbook: Inspire, Engage and Empower,” a couple of general initiatives that the transportation industry can take to combat the underrepresentation of women may include attracting young adults towards the occupation by developing a talent pipeline such as sharing knowledge about the industry and careers starting as early as K-12 level, conducting diversity focused workshops and partnering with organizations on creating initiatives for women in the workforce, particularly addressing special challenges for underserved populations. These may include providing transportation to work, creating networks within the community, and inviting women to the table when decisions are being made.

Other initiatives include ensuring gender-balanced final interview panels for hiring, having a harassment-free culture, policies that allow for taking earned time off, and mentorship with opportunities to build confidence and skills. Research has shown that women tend to choose careers that help in fulfilling their communal goals. In line with this idea, organizations can highlight how many planners, engineers, and policy makers are fulfilling communal goals in their transportation careers. The Transit Cooperative Research Program (TCRP) research report published in 2021 highlighted best practices in improving diversity and inclusion in the public transportation industry. It also provided a resource and guidance toolkit for leaders in the public transportation industry to implement some of the best practices in creating an inclusive and equitable work environment for underrepresented minorities. Link to report can be found here: <https://www.nap.edu/catalog/26230/resource-guide-for-improving-diversity-and-inclusion-programs-for-the-public-transportation-industry>

3.2 GAP ANALYSIS: ATTRITION TRENDS, FAILED RECRUITMENT, AND FTE UTILIZATION AT DTSD

The UWM-IPIT also examined the staffing challenges experienced by DTSD through the lens of attrition trends, failed recruitments, and the gap between actual and required FTE allocation. The following charts represent the attrition trends for different position classifications by region and bureau. Please note the following caveat: since the data provided did not include any working titles, the charts could not capture the more accurate representation of the types of roles where the attrition and failed recruitments have occurred. Attempts to gather the working titles were partially successful because of incomplete and not up to date position descriptions.

All turnover is not detrimental. Turnover can be classified as functional or dysfunctional turnover. In addition, turnover can be either voluntary or controlled. When poor performing employees are terminated, it is controlled functional turnover. When well-performing employees leave because of better opportunities elsewhere or retirement, that's dysfunctional and voluntary

turnover. It would behoove WisDOT to examine the reasons for resignations of high-performing employees through exit interviews. WisDOT could also conduct satisfaction surveys or ‘stay interviews’ with a select group of employees who work in positions that have been marked by high turnover in the past. In addition, workforce planning efforts need to be undertaken in consort with workforce development activities such as training, career development, succession planning, and funding put into these programs to be able to attract and retain capable workers. As stated in the NCHRP Synthesis 543 Report (2019),

“To attract and prepare a new cohort of workers, the transportation industry’s workforce planning and development initiatives will need to ensure that employees keep pace with larger shifts in the economy as a whole and the transportation industry. New technologies, shifts in work–life balance priorities, demands for accountability, data availability and analysis, the rise in labor outsourcing, and the growth in financing options will require that employees be trained in critical skills like communications, management, teamwork, and leadership in addition to quantitative and technical skills (Wittwer et al. 2009).” (p. 8).

The NCHRP 2019 report as well as OPM’s Human Capital Summary 2019 report stressed that although there are close parallels between the transportation sector and US workforce in general, the transportation sector has additional constraints such as salary and benefits that disadvantages it considerably more compared to the rest of the workforce.

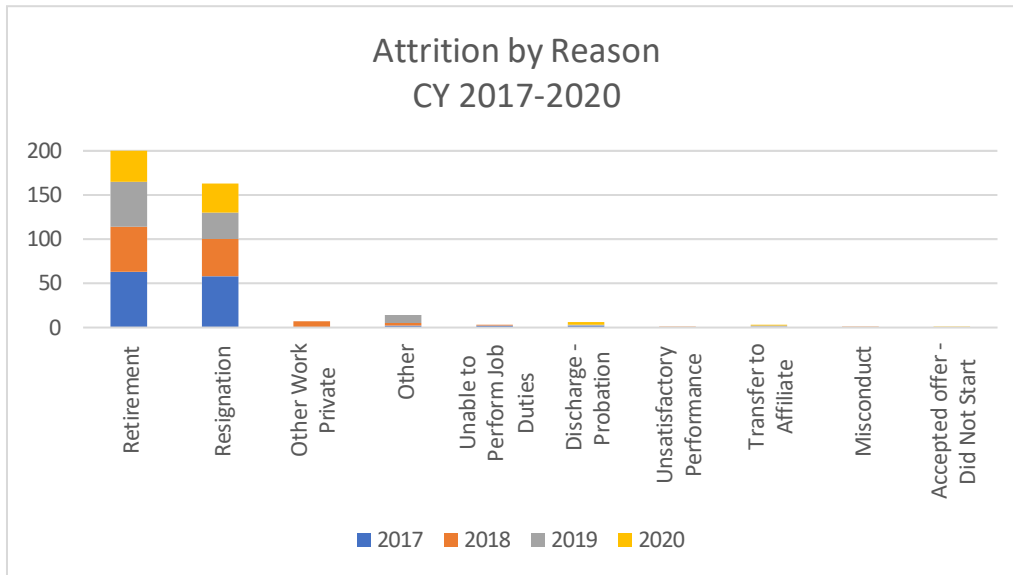
The following pages provide analysis of the drivers of attrition at DTSD over a four-year period, failed recruitment over a two-year period, and a sample representation of activities to maintain critical internal skills sets. Three DTSD Bureaus served as pilot sites for this sample effort.

3.3 DRIVERS OF ATTRITION AT DTSD: TRENDS – 2017-2020

The data provided by the DOA revealed that retirements and resignations were the two leading causes of attrition for the period between 2017-2020. The positions most impacted by these two types of losses were: Civil Engineer Transportation Senior, Civil Engineer Transportation – Advanced, followed by Civil Engineer Transportation Supervisor.

The following chart provides a breakdown of the major reasons for attrition at DTSD between 2017-2020.

Chart 3-1: Drivers of Attrition at DTSD: 2017-2020



The following charts provide a detailed and yearly breakdown of drivers of attrition for different classifications for the 2017-2020 period. As noted earlier, the maximum impact of losses over the four year period 2017-2020 have been felt most acutely within the Civil Engineer Transportation positions – Civil Engineer, Senior and Civil Engineer Transportation, Advanced.

Chart 3-2: Drivers of Attrition at DTSD: 2017

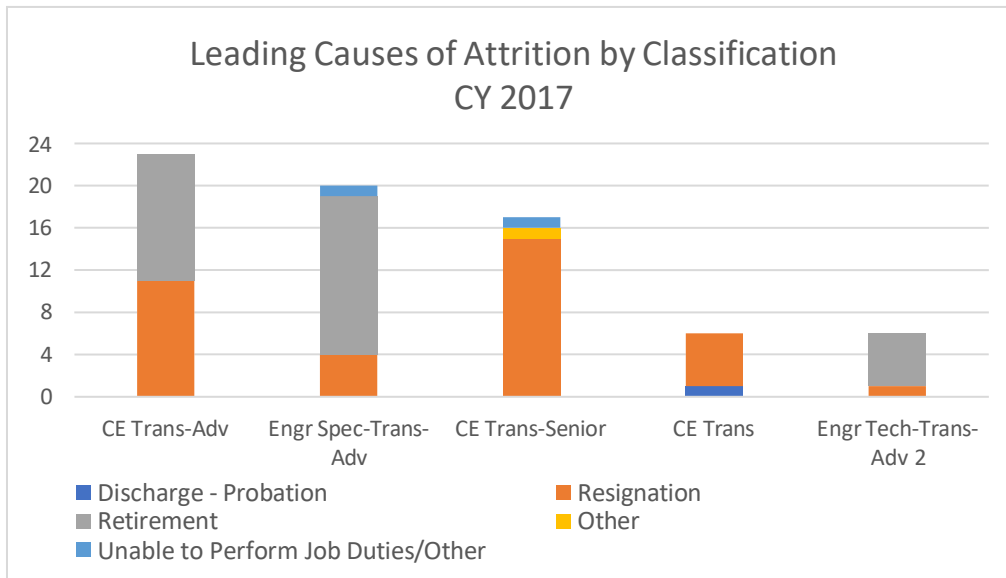


Chart 3-3: Drivers of Attrition at DTSD: 2018

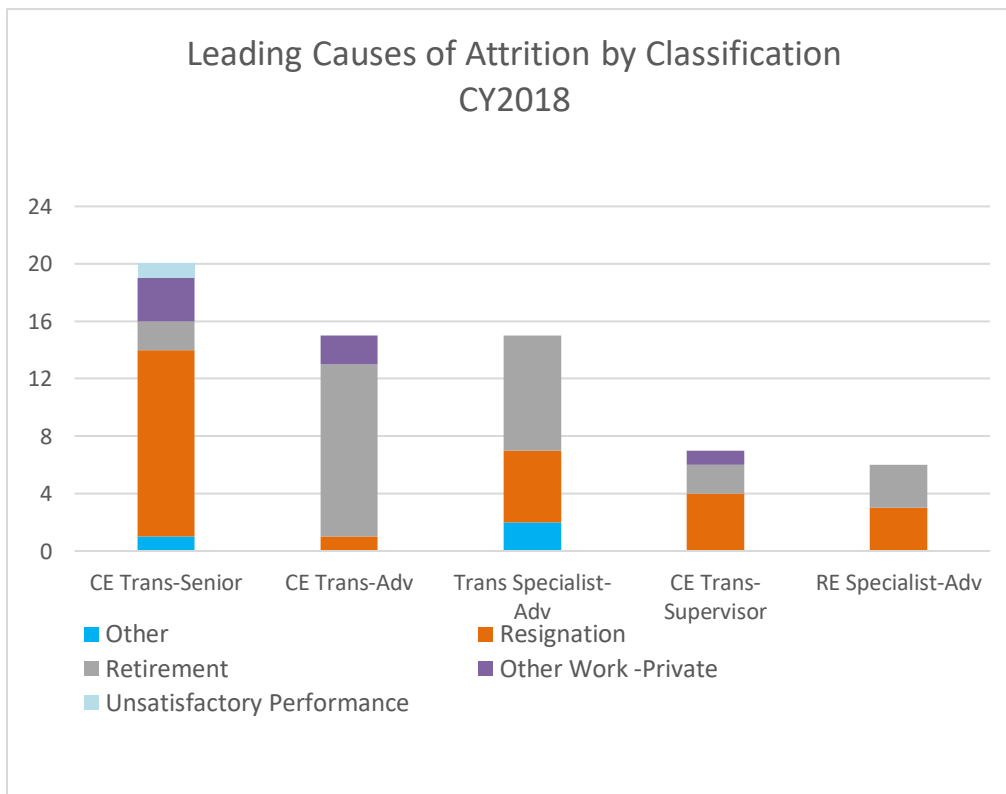


Chart 3-4: Drivers of Attrition at DTSD: 2019

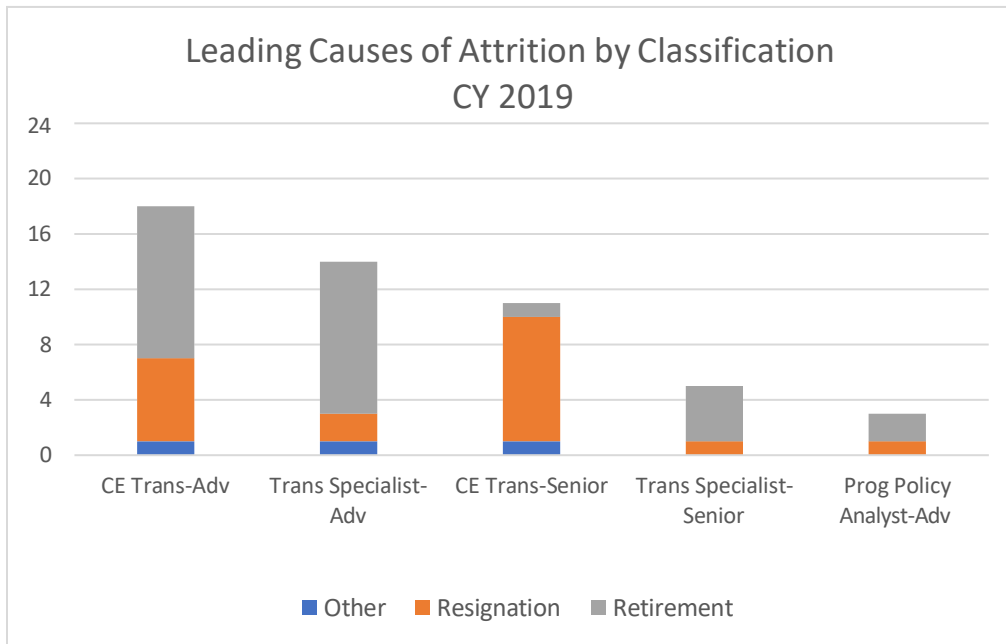
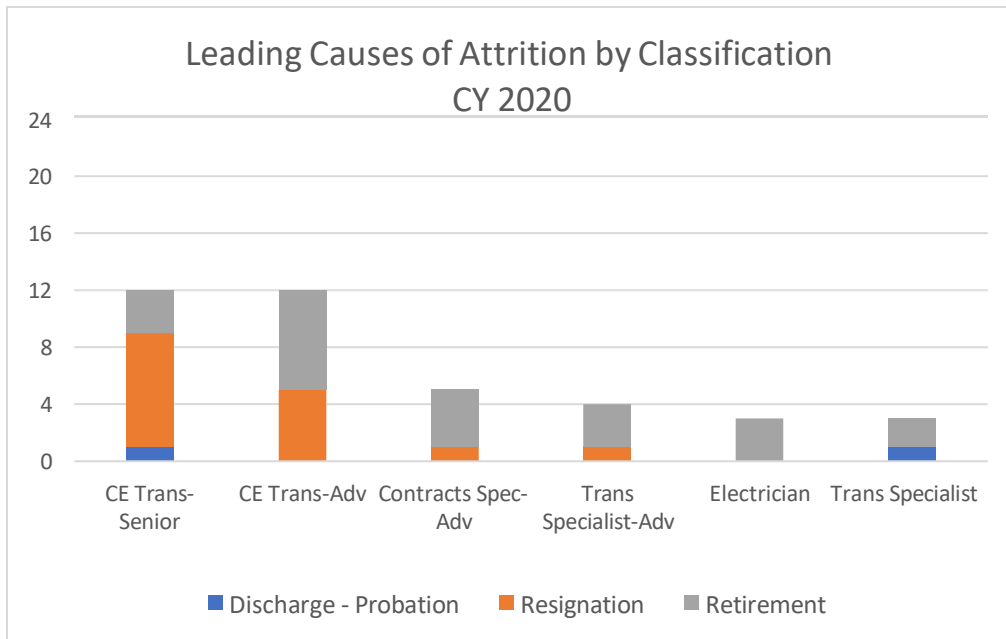
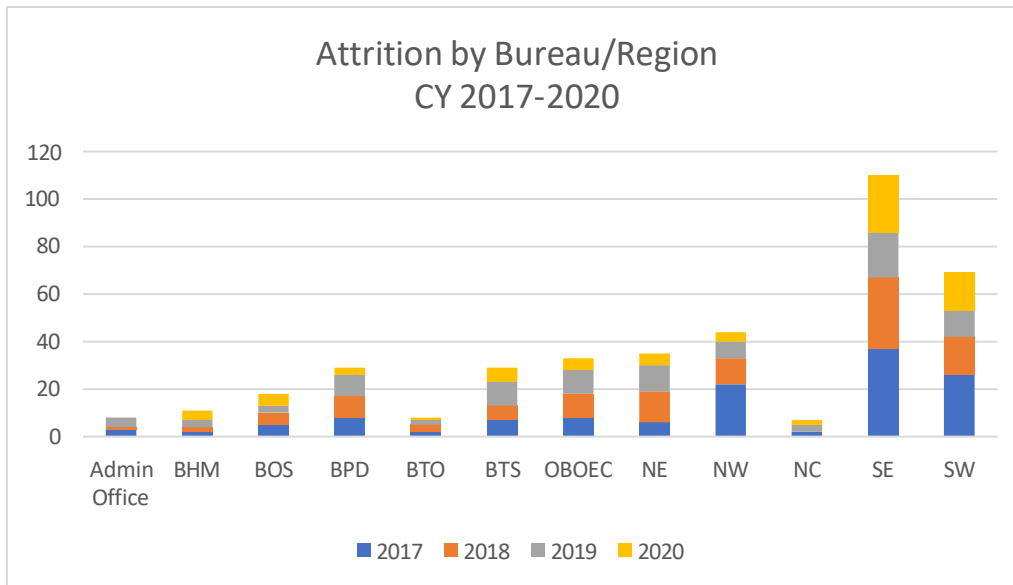


Chart 3-5: Drivers of Attrition at DTSD: 2020



3.4 COMBINED ATTRITION TRENDS ACROSS BUREAUS AND REGIONS: 2017-2020

Chart 3-6: Attrition by Bureau and Region: 2017-2020

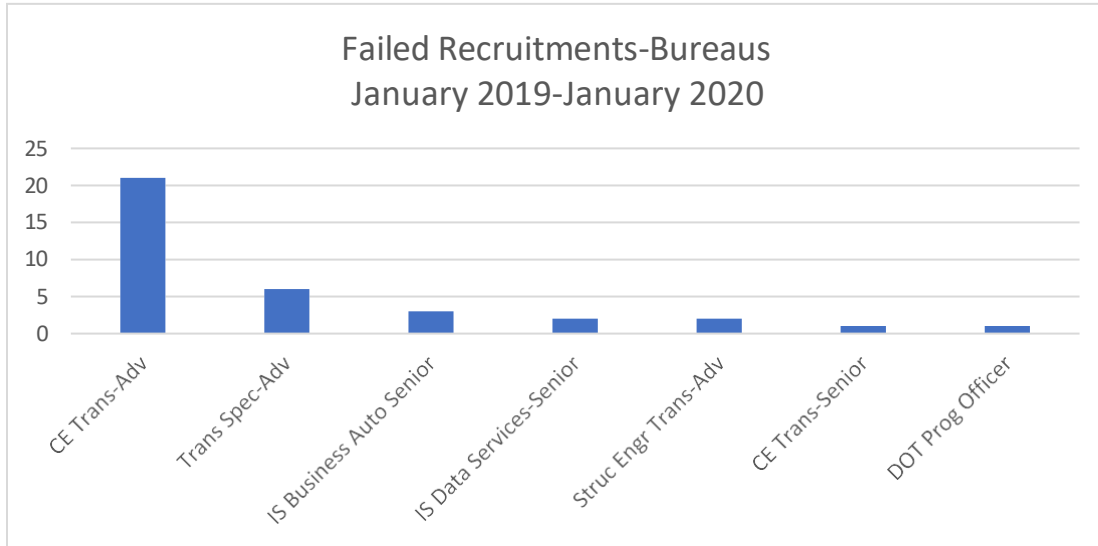


Different regions and bureaus have been impacted differently over the 2017-2020 period. The most personnel losses have been experienced by SE Region followed by SW Region.

3.5 FAILED RECRUITMENTS: ALL BUREAUS

The following chart represents the number of failed recruitments across all bureaus over the two-year period: 2019-2020.

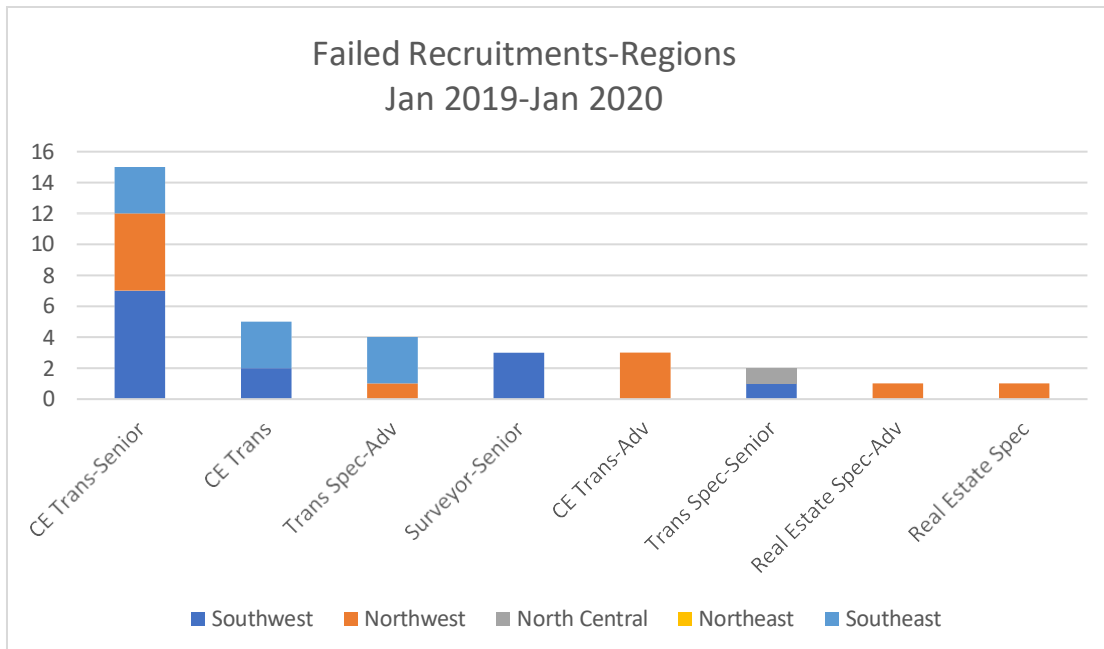
Chart 3-7: Failed Recruitment Across the Bureaus: 2019-2020



3.6 FAILED RECRUITMENTS: ALL REGIONS

The following chart represents the number of failed recruitments across all regions over the two-year period: 2019-2020.

Chart 3-8: Failed Recruitment Across the Regions: 2019-2020



Analysis of failed recruitments across all the bureaus and regions indicated that certain positions have been vulnerable to attracting and filling vacancies, regardless of the region. Those positions are civil engineer transportation-advanced and civil engineer transportation specialist. Data was not available for the failed recruitments as a proportion of total number of open recruitments and those that were successfully filled. Time-to-fill information was also not available.

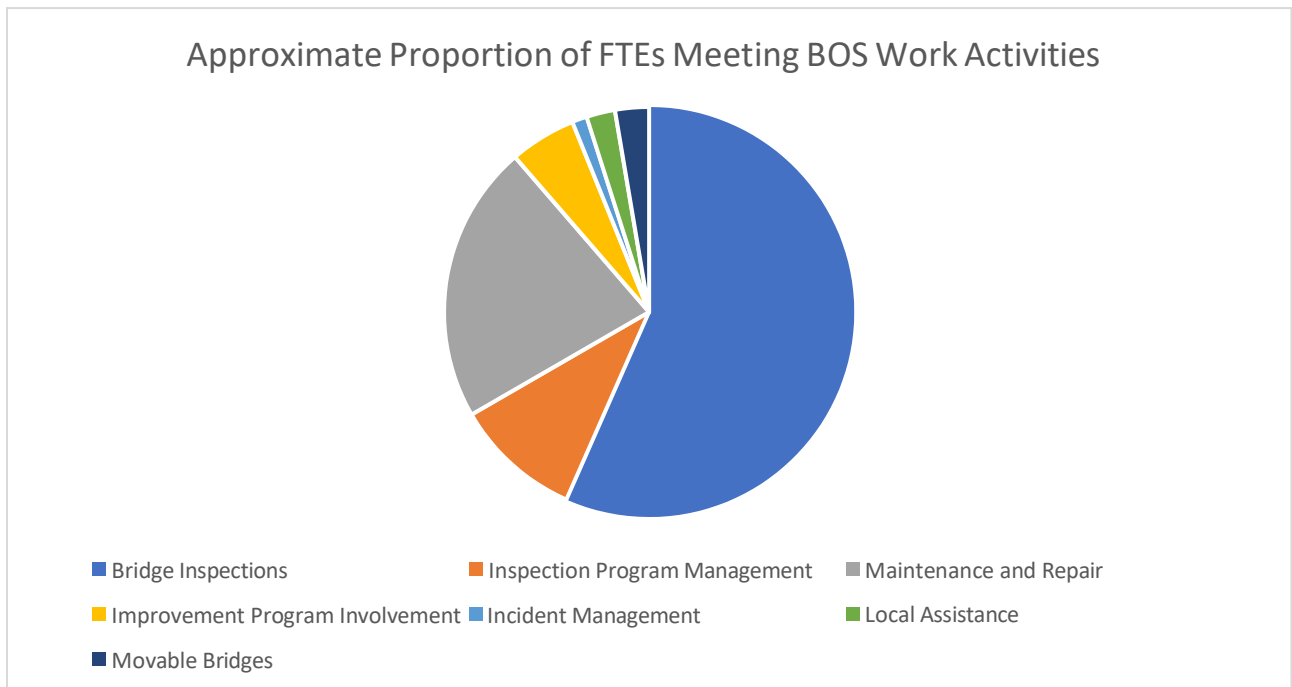
3.7 PILOT GAP ANALYSIS FOR ACTIVITIES TO MAINTAIN CRITICAL SKILLS IN-HOUSE: EXAMPLE DATA FROM THREE BUREAUS

A pilot gap analysis was conducted for understanding the range of activities that were currently fulfilled by FTEs and were needed to maintain critical skills in-house in comparison to the activities performed by consultants. Three statewide bureaus (Structures, Highway Maintenance, and Traffic Operations) served as test pilot sites for this gap analysis. The charts below for three bureaus represented the approximate proportion of work activities met by internal staff versus consultants. Additional details are available upon request from the DTSD team.

Approximate Proportion of FTEs Fulfilling Bureau of Highway Maintenance Work Activities

The chart below revealed that except for Bridge Inspections, the work activities performed in all the other areas within Structures was done so with internal WisDOT staff. Approximately 26% of Bridge Inspections work activities were carried out by consultants.

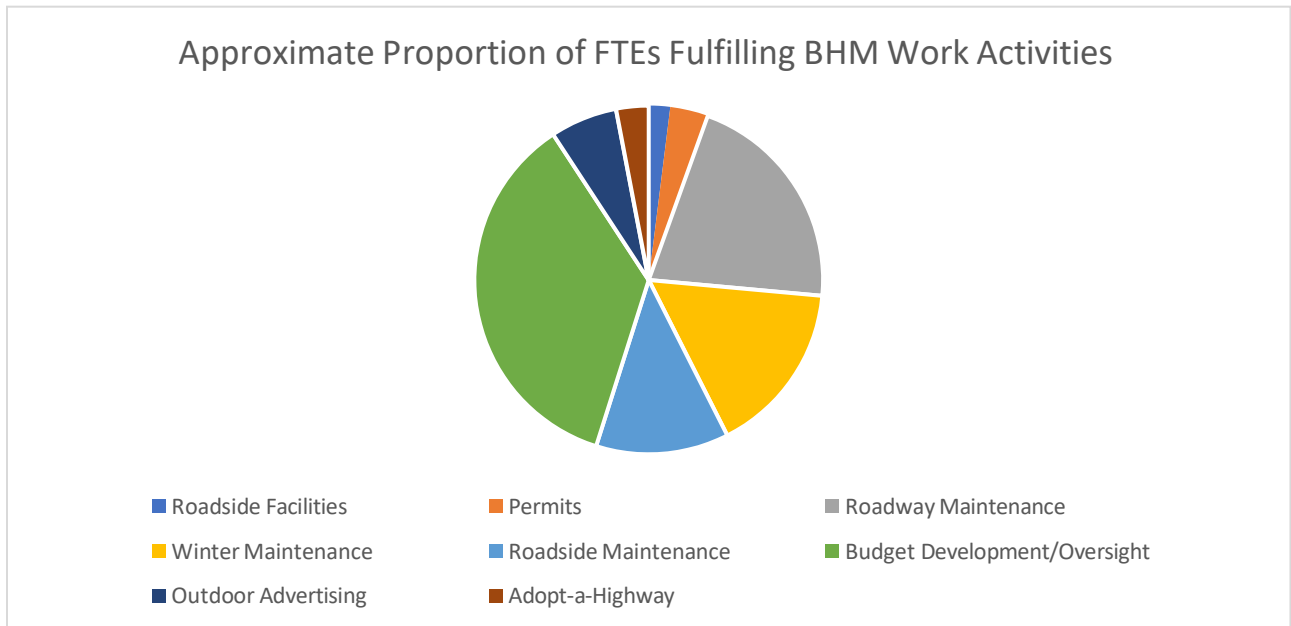
Chart 3-9: Approximate Proportion of FTEs Fulfilling BOS Work Activities



Approximate Proportion of FTEs Fulfilling Bureau of Highway Maintenance Work Activities

The Bureau of Highway Maintenance had a greater proportion of needs met by outsourcing to consultants than the Bureau of Structures. For example, winter maintenance, roadside maintenance, budget/development and oversights office, and outdoor advertising were the activities that had some of their work needs met by consultants. The use of consultants for different work activities ranged from 8%-10%.

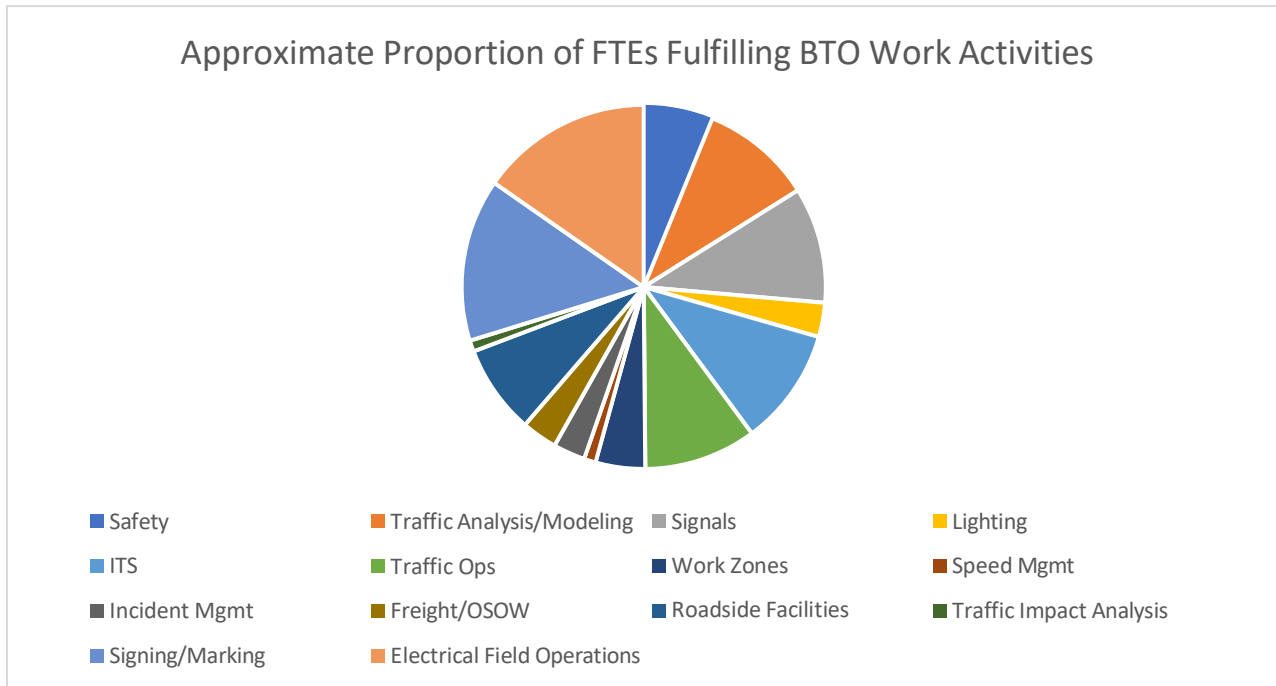
Chart 3-10: Approximate Proportion of FTEs Fulfilling BHM Work Activities



Approximate Proportion of FTEs Fulfilling Bureau of Traffic Operations Work Activities

The Bureau of Traffic Operations had the highest consultant utilization among the three bureaus used in this pilot effort. The proportion of outside consultants used to fulfill work activities ranged from 0% to 62%.

Chart 3-11: Approximate Proportion of FTEs Fulfilling BTO Work Activities



3.8 WORKFORCE ANALYSIS FOR UNDERSTANDING MISSION CRITICAL ACTIVITIES: STRATEGIC PATHWAYS CORE COMPETENCY SURVEY RESULTS

Any meaningful analysis of current versus required allocation of personnel resources for successful fulfillment of agency goals first requires an inventory of mission critical activities and skillsets. The DTSD team did just that by undertaking an extensive pilot effort to inventory mission critical activities and capture the range of personnel resources (FTEs and consultants) allocated for each activity. The DTSD team’s “core competency survey analysis” examined the importance of “core competencies” across different bureaus and regions to capture the range of activities needed to maintain internal expertise. In addition, the survey sought to capture whether the current distribution of FTE resources was optimal in meeting their business objectives, maintaining in-house expertise in mission critical areas, compliance with responsible charge requirements, and sound financial stewardship. The team operationalized competencies in terms of key “activities” within each region and bureau that were necessary to maintain critical skillsets. This analysis served as a representative effort of workforce analysis and planning as per the FHWA best practice guidelines discussed in Chapter 1.

Method

The DTSD team created a survey that was sent to all the DTSD Directors and assessed their perceptions about the core competencies, i.e., activities that were deemed most important for the agency to maintain in-house expertise. Their responses were given on a scale of 1-10 (with 10 indicating relative importance of a particular activity needed to maintain critical skillsets internally). To aid the respondents in evaluating the relative importance of each activity, information on the approximate current percentage of FTEs and consultant effort was provided. This was a unique and judicious way to ensure that all respondents had the same baseline understanding of the current status of in-house/outsourced effort while evaluating the relative importance of activities. The respondents were also asked their perception of the relative importance of activities needed to maintain their internal expertise. The perceptions were also assessed on a scale of 1-10 such that a score of 10 indicated high relative importance for the division to maintain internal expertise regarding a specific activity. The format of the survey questions and the ratings used by the DTSD team is given in Appendix 2. This was a pilot effort with the purpose to demonstrate a different way of approaching workforce skills gap analysis.

Results

The DTSD team analyzed the survey results and discussed the findings with all the directors and the AO's office. The team plotted the cumulative ranking of different activities by importance across all regions and bureaus. Further, the results were plotted by the recommended importance of activities that needed to be maintained in-house across the regions and bureaus. Finally, a scatterplot of importance of each activity versus the recommended activity to be maintained in-house was created to assess the degree of correspondence of the ratings for the different activities. The discussion on all the findings was used to solicit reactions to the ratings and arrive at a consensus on the types of activities that needed to be maintained in-house as well as where FTE resources needed to be shifted in order to address the recommended maintenance of internal expertise of mission critical activities.

Range of Activities at the Region Level for Maintaining Internal Expertise: The results of this analysis indicated the top five activities required to maintain in-house at the regional level were:

- Programming: 85% rated it as 9 out of 10 in importance as an area in which it was necessary to maintain in-house expertise.
- Safety: 63% rated it as 8.3 out of 10 in importance as an area in which it was necessary to maintain in-house expertise
- Scoping and Preliminary Engineering: 72% rated as 8.1 out of 10 in importance as an area in which it was necessary to maintain in-house expertise.
- Structures Inspection and Repair: 68% rated it as 8 out of 10 in importance as an area in which it was necessary to maintain in-house expertise.
- Incident Management: 81% rated it as 7.9 out of 10 in importance as an area in which it was necessary to maintain in-house expertise.

The following chart displays the top five activities. Detailed results are available upon request from the DTSD team.

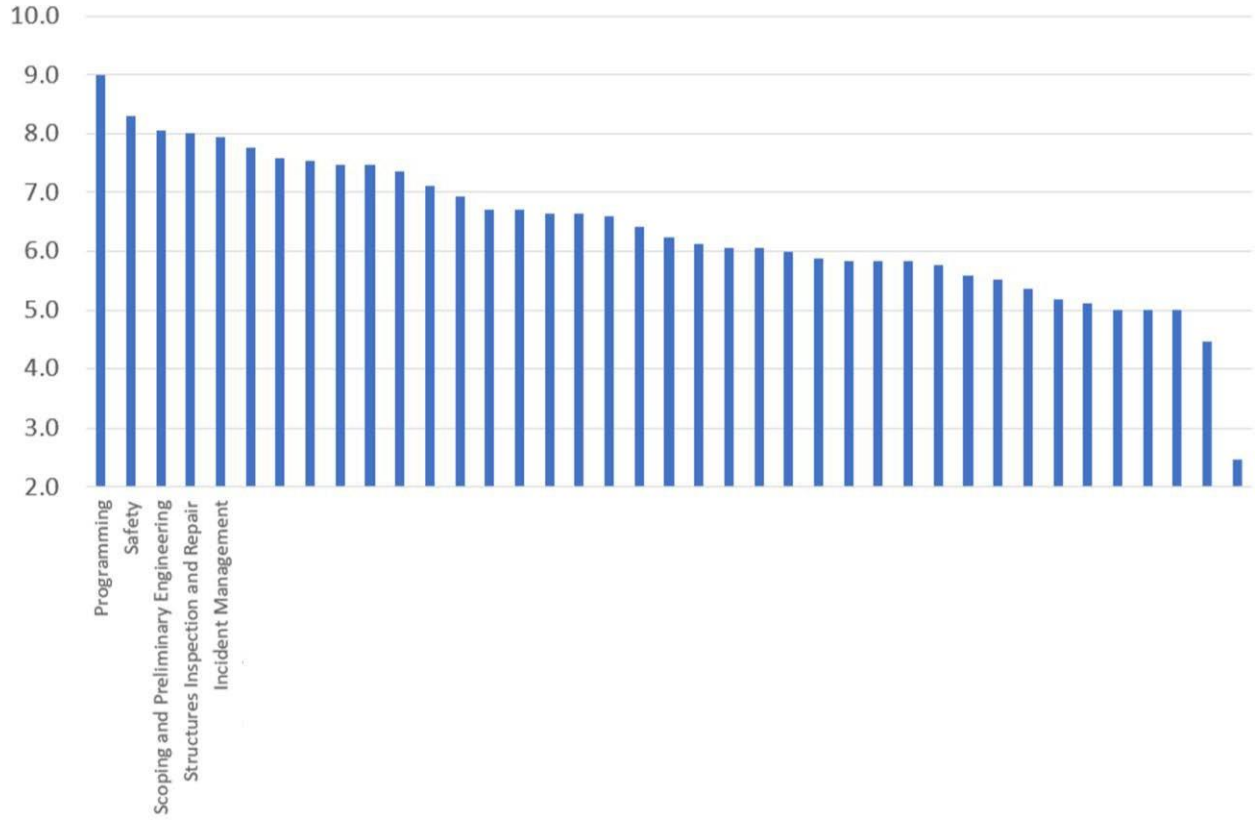
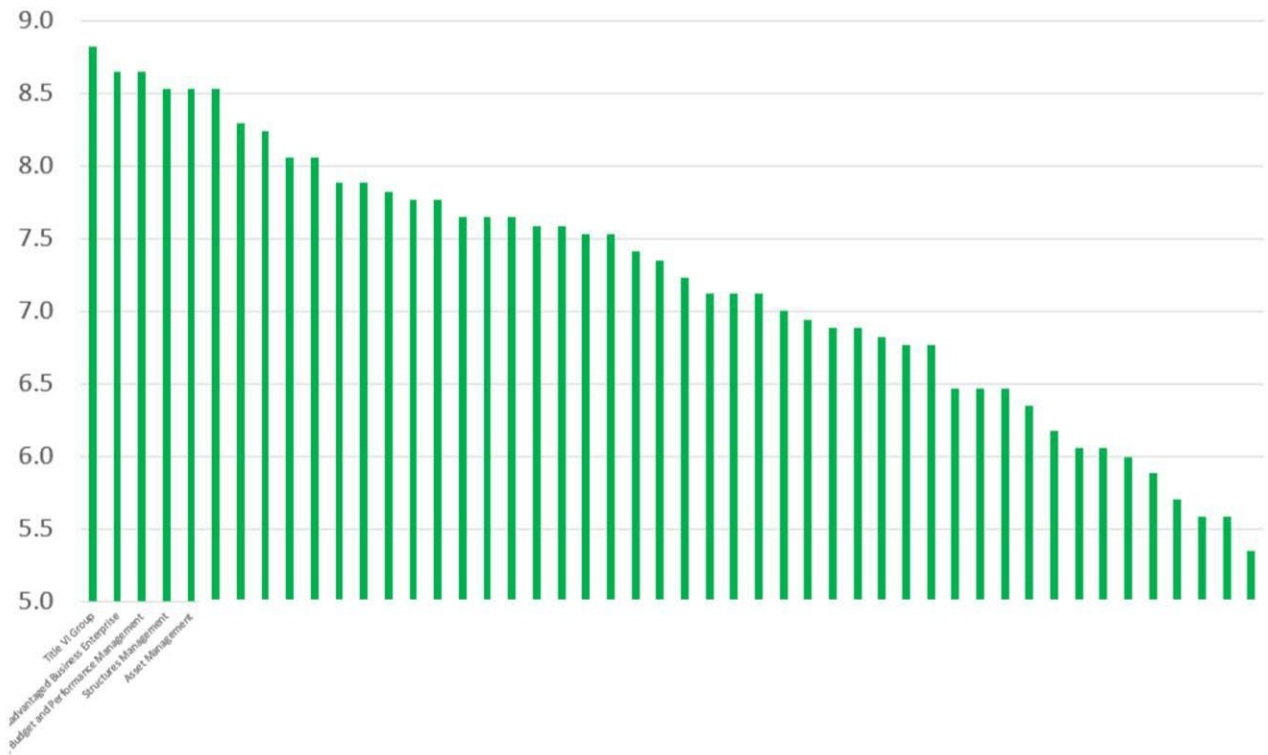
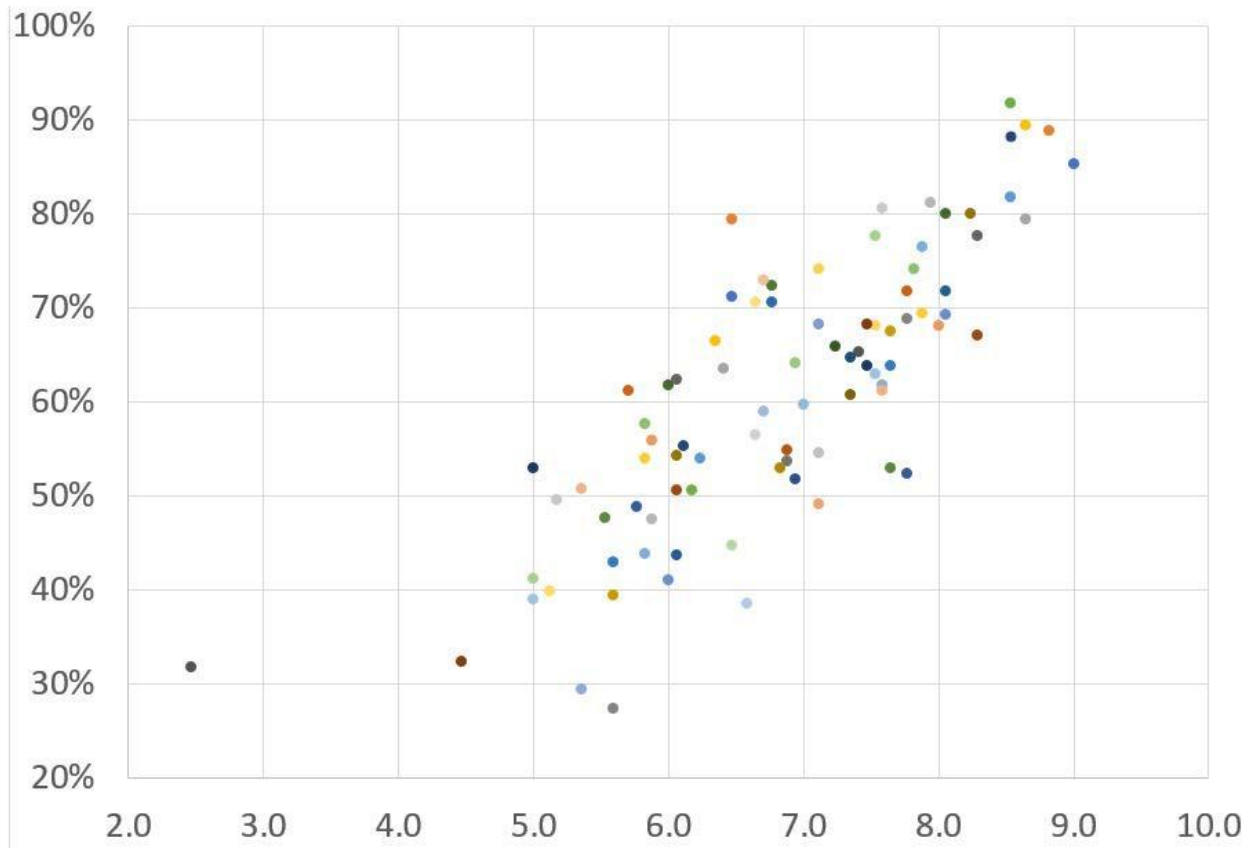


Chart 3-13: Range of Bureau Activities Recommended for Maintaining Internal Expertise



Current Activities vs. Recommended Activities to Maintain Internal Expertise: There was a close, but not perfect, correlation between the importance rating and the percentage of the program that must be kept in-house, indicating a recommendation by the respondents that the most important and critical functions of the division should be maintained in-house and performed by WisDOT employees. The chart below shows the correspondence between the importance of activities and their recommended maintenance within WisDOT. This exercise in understanding which areas are most important and where resources need to be shifted in the future could be conceived as a technique to proactively manage the allocation of resources to prevent gaps from negatively impacting outcomes in program development or project delivery.

Chart 3-14: Importance of Mission Critical Activities vs Activities Recommended to be Retained Internally



3.9 ROOT CAUSE ANALYSIS

The results also revealed that resources are stretched thin with regard to providing oversight functions and some resources needed to be shifted into that role. Following the administration and analysis of the survey, discussion based on survey results ensued to identify areas from which resources could be moved to areas in need of more internal positions to maintain core expertise. Following the core competency survey analysis, the DTSD team also conducted a comprehensive root cause analysis that categorized and quantified whether the root causes of SWOT factors, GPP core values, and the three WisDOT pillars lay within the organizational structure, its systems, processes, and/or people. The format used for root cause analysis is in Appendix 3.

Results and Outcomes

This exercise integrated results from various data sources for the DTSD team to better trace the roots of their core areas of strengths, weaknesses, opportunities and threats as it related to their guiding principles, values, and agency mission. The root cause analysis also enabled the team to identify the locus of change efforts to be initiated that would capitalize on their strengths to take advantage of the internal/external opportunities and address the threats and overcome their

weaknesses. The root causes analysis provided a blueprint for the team to understand the personnel resources that would need to be allocated to better position the division and the agency to maintain expertise in critical areas and meet its stated objectives. Results of root cause analysis were used to propose a number of different types of modifications to the current organizational structure and chart. Potential organizational restructuring options researched by the DTSD team and presented at the Directors' Meeting were selected on the basis of addressing any current or foreseeable key factors identified through SWOT and gap analysis. Various modifications of the current DTSD organizational structure that were researched and discussed are available upon requested from the DTSD team.

Any decision to change organizational structure, any process, or systems, or shift any types of resources – personnel, budgetary, or technology – need to be taken in light of the different types of data collected as well as the perspectives shared by the respondents throughout the data collection and discussion process. In addition, any change efforts need to be in accordance with best practices highlighted by the UWM-IPIT team at the June 2021 Directors' meeting.

An important point to be reiterated here is that the survey results reflect the mission critical activities identified by the DTSD team, while the efforts to identify the mission critical core competencies have not been initiated.

CHAPTER 4: BENCHMARKING AGAINST PEERS

INTERVIEWS WITH PEER DOTs

This chapter provides a summary of key points contained in the responses to questions asked by the UWM-IPIT team. The implication of these interviews for WisDOT is summarized at the end.

Three interviews were conducted with three DOTs identified as being similar to WisDOT in scope. Ms. Rebecca Burkel, Administrator for DTSD, helped connect the UWM-IPIT team to potential interviewees: Ms. Nancy Daubenberger, Minnesota DOT, Ms. Amber Thelen from Michigan DOT, and Mr. Ed Hassinger from Missouri DOT. Each interview was conducted virtually via Microsoft Teams and lasted 60 minutes. Romila Singh and Mark Gottlieb jointly interviewed the three DOT leaders. Each leader was asked the same set of questions that were shared with them ahead of time. Before the interview, each DOT was requested to share basic information on its size by way of staffing, size of highway and bridge program and percent of work outsourced to provide a context to our discussion.

4.1 MINNESOTA DOT PRE INTERVIEW BACKGROUND INFORMATION FOR CONTEXT

If possible, it would be helpful to have the following comparative information prior to our meeting. If no values are available, please just indicate the estimated magnitude of change in the comment column (e.g. “increased 10 %”, “stayed about the same”, etc.)

The information contained in this table was filled out by MnDOT and is shared here verbatim.

	2010	2020	Comment
Staffing in Operations (FTE)	3775	4086	71 Additional FTE’s were due to reorganizing the Operations Division with two offices from other areas.
Staffing in Engineering Services (FTE)	463	544	Most of the increase is due to reorganization of the Engineering Services Division. Without those changes, the Division reduced by 38 FTE’s.
Size of Highway and Bridge program (construction contract \$)	\$595 million	\$939 million	These represent our “regular program” of state and federal funds. Below is a summary of our state bond authorizations from state trunk highway funds. From 2010 through 2020, we averaged about \$200 million per year in bond financed construction projects.
Percentage outsourcing of highway design		\$90 million	\$90 million was the amount in the STIP for external project delivery. Not sure what percent of design that is, but its probably about 50%, which may be about the same as 10 years ago. Program delivery fluctuates due to the up and down bonding amounts.

Percentage outsourcing of construction oversight	10%	15%	We have always done the vast majority of the contract administration with our own staff.
Percentage outsourcing of system operations (not design or construction)			Percentage of system operations outsourcing is very low.

Bond Chapter	Bond Authorization Year	Total
Chapter 152	2008	1,717,694,000
Chapter 388	2010	100,000,000
Chapter 117	2013	300,000,000
Chapter 5	2015	140,000,000
Chapter 3	2017	940,000,000
Chapter 214	2018	416,190,000
Chapter 3	2020	300,000,000
Grand Total		3,913,884,000

4.2 MINNESOTA DOT: VIRTUAL TEAMS MEETING WITH MS. NANCY DAUBENBERGER (DEPUTY COMMISSIONER)

JULY 9, 2021

The UWM-IPIT conducted a virtual interview with Deputy Commissioner Nancy Daubenberg. The interview focused on their organizational structure, workforce planning, retention, and knowledge management.

The following questions were asked of all interviewees.

Responses to the first five questions are summarized because the interviewee combined them in her discussion.

Reorganization and Outsourcing

Q1. Has your agency undergone any structural reorganizations to deal with workforce issues or to accommodate emerging needs in the services you provide? If so, how successful do you think these changes have been, and what would you possibly do differently?

Q2. Has your agency also experienced a gradual increase in outsourcing?

Q3. If so, what specific functions/skills have you tried to maintain in-house? Why, and with what degree of success? In other words, what are the most important functions that should continue to be performed by state staff, and why?

Q4. Where have you had the most success in outsourcing?

Q5. How have the roles of state staff changed in the transition from production to oversight?

- MnDOT has outsourced roughly half of the design work and 15% of the construction management is outsourced. They would like to outsource more of construction management because of staff shortages and other issues but they haven't. Bulk of the project development is outsourced and the latter part of the development process like scoping and preliminary design is kept in-house. They do a lot of scoping and preliminary design work in-house because of the decision-making and staff that are invested in those aspects of the work. With regard to mega-sized and complex projects, like the border bridge project, consultants were hired with expertise in bridges and large roadways to help with scoping and the MnDOT staff worked alongside in the project management and public engagement facets. The consultants were hired because they didn't have in-house expertise for those mega-sized projects. Some percentage of the final design was done in-house and it was important for them to maintain that expertise in-house and they also mentioned that they have the capability to assess the consultants' work. It was also mentioned that engineers like to do the design work so it was important for MnDOT to keep the design capability in-house not only for business reasons but also for using it to attract and retain engineers by using it as a continual career growth and development feature.

- MnDOT’s organizational structure uses districts instead of regions for organizing their work. There are eight districts in MnDOT. Bridge design is in the central district and all the road design is out in the other districts. There is very little of moving of work from one district to another because of either technical expertise or workload management reasons. If the district doesn’t have the expertise they need, they consult it out rather than move work to another district. The interviewee mentioned that they were very centralized in their project development and delivery at one point, then moved to becoming decentralized and now it’s a mix with project management being decentralized and project development and delivery being more centralized.
- They have the shared services model as well and that reports to the operations division and the shared services do work for all the districts. A couple of recent examples of shared services doing design work was in terms of coming up with structural snow fences for managing snow drifts and noise analysis. Utilities and real estate functions are not in shared services and are placed in districts. Some real estate experts are in shared services to help with appraisals and office of land management is also in shared services. A little mixed model – some in shared services but most of it is being done in districts.
- On the whole, there were no major reorganization or restructuring efforts that were undertaken except for the changes to the shared services model and some moving of offices within the division.
- Outsourcing with regard to operations issues such as traffic, electrical, maintenance management was very little and it was mostly done in-house. They have introduced a new model in this arena called the “Negotiated Maintenance Contracts” that allows that to solicit bids from small businesses, including minority owned businesses on maintenance type of work. They have used a state statute to design this model to advance equity in the state by reaching out certified small businesses in the state for bids on projects totaling \$250,000 and the lesser of the two bids is accepted after negotiation. They have had much success with this initiative.

Performance Metrics

Q6. Have you developed specific training programs to improve your staff’s understanding of the oversight role and how to perform it?

Q8. What specific metrics have you developed to assess the performance of state staff in an oversight role?

- They have developed an in-house training program project management. They have an office of project management and technical support and for the last five years or so, they have developed a robust training program for project managers and train managers not only on project management, but also oversight skills to help reach their goals for on-time, delivery, quality, scope, and cost management.

Q7. What specific metrics have you developed to assess the performance of outside consultants?

- They have developed a performance evaluation application and an app that collects evaluation information for their professional, technical contractors. In addition, they have a state statute, Minnesota 16C.08, subdivision 4C that requires that on completion of the contract, anything over \$25,000 dollars that each state agency submits a one page report that summarizes what was spent and includes a written performance of the work done under the contract and includes ratings related to personnel, deliverables, project development, and project management. The consultant performance reviews were provided with as much honesty as humanly possible although some may have been less comprehensive in their assessments.

Workforce Planning, Succession Planning, and Knowledge Management

- Staff in central HR office do workforce planning with expertise in that area, and for the last several years, the HR staff do business planning along with workforce planning in district offices as well. As stated by the interviewee, “workforce planning goes hand in hand with business planning and succession planning.” Business planning started a little over six years ago and is linked to strategic planning. Succession planning has developed organically. During these planning meetings, they are very keenly working on diversifying the bench strength by looking at building a diverse pipelines from the “springboard positions” to leadership positions. They actively engage in diversity training as part of succession planning and identify people for these “springboard positions” to leadership positions by choosing the training and experiences necessary to advance those employees in those roles. This approach to succession planning that integrates diversity training lens is being applied for supervisor and leadership type positions and it is not widespread across the agency.
- They also use “temporary mobility assignments” as a feature for succession planning. When a vacancy comes up due to retirement or resignation, instead of filling it right away, they use that vacant position to offer it to employees who may not have thought of that role but have been identified as being interested to develop in that capacity enroute to a higher leadership position. As an example, a high performing program delivery manager who is identified as a good candidate for the role of a district engineer during the succession planning process, could be placed in a maintenance role that becomes vacant and then once armed with that experience, is likely to get promoted to a district engineer. Succession planning and knowledge management have been usually tightly integrated for highly technical roles. For the most part is run as a centrally coordinated activity by the central HR staff and they rely on ‘callouts’ as well where someone announces that they have a vacancy coming up and are interested in making it a “temporary mobility assignment.” Some ad hoc succession planning is also carried out at the district level. However, most of these activities on succession planning are confined to highly technical areas.

- The work and process of workforce planning is carried out by the central HR staff in alignment with their HR reps in the district offices. The central and district HR staff use spreadsheets and same set of metrics to collaborate and coordinate in workforce planning, recruiting, retention, and performance management. They also work very closely with the district leadership in making decisions on succession planning.

Integration of Succession Planning And Knowledge Management

- Knowledge books are used for deep technical expertise for those retiring in 6-12 months that do “brain dump with interactive PPT” and add inputs to training programs or YouTube videos on that topic. Examples of knowledge books included topics on structured steel expertise from someone who was retiring from the bridge office, and topics on deleterious materials and aggregates from someone from the materials office with expertise in those areas. It’s not a systematic process and is not clear if it is left to the discretion of the individuals if they want to do this and as noted earlier, it is an activity that does not run deeply throughout the agency and is confined to highly technical roles.
- Another transfer of knowledge process followed at MnDOT involves double-filling a position for about 6-12 months before the person retires. This is typically for highly technical positions.
- Mentoring, both formal and informal, is also used for the highly technical positions for knowledge management and also used as a tool for career growth and development.

4.3 MICHIGAN DOT PRE INTERVIEW BACKGROUND INFORMATION FOR CONTEXT

If possible, it would be helpful to have the following comparative information prior to our meeting. If no values are available, please just indicate the estimated magnitude of change in the comment column (e.g. “increased 10 %”, “stayed about the same”, etc.)

The information contained in this table was filled out by Michigan DOT and is shared here verbatim.

	2010	2020	Comment
Staffing in Operations (FTE)	887.7	1,278.7	2010 Staffing in Operations = 887.7 (834.7 maintenance, 12 ITS, 41 Blue Water Bridge) 2021 Staffing in Operations = 1,278.7 (760.7 maintenance, 357 system operations management, 120 business services, 41 Blue Water Bridge) There was an increase of 391 FTEs from 2010 to 2021.
Staffing in Engineering Services (FTE)	1,482.8	1,031.3	2010 Staffing in Engineering Services = 1,482.8 (787.1 engineering services and 695.7 program services) 2021 Staffing in Engineering Services = 1,031.3 (1,031.3 program development & delivery) There was a decrease of 451.5 FTE’s from 2010 to 2021.
TOTAL Staffing Highways/Bridges	2,370.5	2,310	Decrease of 60.5 total staffing for Highway/Bridges from 2010 to 2021
Size of Highway and Bridge program (construction contract \$)	\$1.436 billion (FY 2010 road and bridge program)	\$3.6 billion (FY 2021 total road and bridge program)	MDOT's FY 2021 program investment is \$4.17. Of that total investment, MDOT will dedicate approximately \$3.6 billion to system preservation, maintenance, safety, and operation of Michigan’s state trunkline roads and bridges. Note that MDOT’s program is larger in FY 2021 than prior years, largely due to the bond funding from Governor Gretchen Whitmer’s Rebuilding Michigan Program.
Percentage outsourcing of highway design	50% MDOT/50% consultant	40% MDOT/60% consultant	2010 - estimated; 2021 - For design, we typically run about 40% in-house vs. 60% consultant work. %s are “by” dollar

			amount expended for design work. In addition to this change over time in the amount of work going to consultants, we have a larger program in 2021 due to the Governor’s Rebuilding Michigan Bond Program so additional work has gone to consultants.
Percentage outsourcing of construction oversight	60% MDOT/40% consultant	44% MDOT/56% consultant	2010 - estimated; 2021 - In addition to this change over time in the amount of work going to consultants, we have a larger program in 2021 due to the Governor’s Rebuilding Michigan Bond Program so additional work has gone to consultants.
Percentage outsourcing of system operations (not design or construction)	70% MDOT/30% contract	20% MDOT/80% contract	2010 - estimated, Michigan only had one TOC and had more permanent TMWs to do non-winter maintenance tasks in house; 2021 - Contract forces would be contractors, consultants, county road commissions and local agencies. Currently MDOT contracts with the counties for maintenance in all but 20 counties (19 by MDOT and 1 private contractor in the others). In addition, we contract out some other routine maintenance tasks (all mowing, rest area maintenance, etc). All TOC (transportation operation center) operations and ITS maintenance repairs are also performed by consultants/contractor.

4.4 MICHIGAN DOT: VIRTUAL TEAM INTERVIEW WITH MS. AMBER THELEN (DIRECTOR OF OFFICE OF ORGANIZATIONAL DEVELOPMENT), BRAD WIEFERICH (DIRECTOR OF BUREAU OF DEVELOPMENT), AND MR. GREGG BRUNNER (BUREAU OF FIELD SERVICES DIRECTOR)

AUGUST 9, 2021

The UWM-IPIT Team conducted the interview with the following Michigan DOT leaders: Ms. Amber Thelen, Mr. Brad Wieferich, and Mr. Gregg Brunner. Portions of the interview questions were responded to in writing by Ms. Thelen's office and are italicized to distinguish them from the other points noted during the Teams Meeting.

FUNCTIONAL ORGANIZATION

The division is fundamentally organized into central bureaus with responsibility for policy and statewide standards development, and regional offices with responsibility for program planning and delivery. Given the mission and current staffing realities, is this organizational structure appropriate, or should the division be realigned or reorganized along another model?

Q1. Has your agency undergone any structural reorganizations to deal with workforce issues or to accommodate emerging needs in the services you provide? If so, how successful do you think these changes have been, and what would you possibly do differently?

- *In 2017, MDOT created the Bureau of Bridges and Structures to consolidate and align all bridge design, construction, maintenance, inspection, asset management and emergency response function into one Bureau. This was done to create redundancy, develop succession planning and knowledge management procedures, and ensure a consistent, statewide approach to all things bridge.*
- *In 2019, MDOT adopted a Workforce and Succession Planning System, referred to within the department as the "MDOT House". In addition, the department created the Office of Organizational Development to support the implementation and manage the MDOT House. The House and OOD were created to place additional focus on MDOT's workforce and associated challenges including an increased competition for talent, the large percentage of MDOT's workforce eligible to retire (e.g., in 2017, 40% were eligible to retire in 5 years and in 2019, it was 32% eligible to retire in 5 years), generational differences in the workforce, a declining pipeline of talent, and to help the department plan for the workforce needs of the future. To illustrate this, there are 90 annual openings of surveying positions within MDOT and within Michigan's broader transportation industry and only 16 people graduated from Michigan colleges and universities with that degree needed for those positions.*
- *The MDOT House has several pillars designed to strengthen our Workforce and Succession Planning System. Through the Employee Lifecycle pillar, we are placing focus on all phases including recruiting and selecting. For example, MDOT has a robust collection of Workforce Programs aimed at preparing the future workforce. Another pillar, the Talent Review Process, is setting time aside two times each year for the department work areas to*

have a conversation about their talent with a focus on succession planning and workforce needs. The Talent Review Process flows both ways: from the top-down and then bottom-up. The Knowledge Management pillar is creating a system for the department's intellectual capital to purposely flow within and across the department and be accessible to employees. One Knowledge Management pillar example is the creation of a department-wide Community of Learning for Project Managers. This was in response to the department's increased use of contracts for the professional services to address the many needs of our aging infrastructure and most recently, this is specific to Governor Gretchen Whitmer's bond funded "Rebuilding Michigan" program that doubled the size of MDOT's road and bridge program. In addition, due to the workforce trends, MDOT has many employees who were new to project management. The Project Management Community of Learning provides a forum for project managers to learn from each other, to share key information, and address challenges together as a collective. In addition, MDOT is paying special attention to addressing diversity in the transportation workforce by recruiting from Historically Black Colleges and Universities (HBCUs) and from out of state. In the summer of 2021, there were 59 interns, most of them from out of state.

- *MDOT's road and bridge program has doubled in size as the department implements Governor Gretchen Whitmer's bond-funded "Rebuilding Michigan" program. To prepare for this increase in work, MDOT's Bureau Directors, Office Administrators, Region Engineers, and Division Directors developed a collaborative strategy to address the challenges of successfully implementing this program without an increase in department staff. The strategy included policy changes, streamlining, shifting of responsibilities within work areas, knowledge management efforts, and communication. The strategy is named "MDOT's Augmented Program Delivery Plan and it was adopted in 2019. Many items in this plan have been implemented over the last year plus. I have attached this plan for your review.*

Internal And External Resource Management

The division has lost hundreds of staff positions while the size of the highway improvement program has grown, and adding new positions is not a politically viable option. Compensation challenges also make it hard to hire and retain experienced staff in highly technical subject areas. This has caused an increase in the amount of work that is being outsourced to private consultants. Most of the increase in outsourcing has been in project design and construction engineering. Is the current mix of internal and external resources appropriate, or should the mix of how state staff and outsourced consultants are being used be changed?

Q2. Has your agency also experienced a gradual increase in outsourcing?

- *Yes. Consultants are now almost exclusively designing the most complex bridge projects. With an increased construction program, we have seen additional contracts for full and as-needed construction engineering. There have also been additional design contracts in ITS and Traffic signals as necessary to deliver the program. The same is true for road design in*

general. MDOT's capacity for design is capped. Therefore, any increase in funding will require outsourcing.

Q3. If so, what specific functions/skills have you tried to maintain in-house? Why, and with what degree of success? In other words, what are the most important functions that should continue to be performed by state staff, and why?

- *In house bridge and structure design and construction administration is still a must, and a core competency MDOT cannot afford to lose, considering the responsibilities involved with our state's bridges. Bridge Design Project Managers (PMs) have both in-house design, and consultant management experience, and we keep this cycle going so that no PMs become purely administrative. We are trying to retain our expertise in house - you can't oversee a contract for something staff doesn't know how to do. For this reason, MDOT also maintains road design and some survey capacity in all seven regions, supported by central office resources.*

Q4. Where have you had the most success in outsourcing?

- *MDOT has many prequalified consultants performing road and bridge design, construction administration, and inspection. All areas have been successful, in terms of outsourcing, however, all areas have PMs with the specific experience involved to properly manage the consultants.*

Q5. How have the roles of state staff changed in the transition from production to oversight?

- *More administrative functions such as estimating, negotiating, ensure funding is secured, involvement in the environmental and permit processes, etc.*

Q6. Have you developed specific training programs to improve your staff's understanding of the oversight role and how to perform it?

- *MDOT has largely addressed this need through the department-wide Community of Learning for Project Managers. This was in response to the department's increased use of contracts for the professional services to address the many needs of our aging infrastructure. In addition, due to the workforce trends, MDOT has many employees who were new to project management. The PM Community of Learning provides a forum for project managers to learn from each other, to share key information, and address challenges together as a collective. They developed a team charter, meet regularly and take turns sharing and presenting on various topics, and have discussion. They have regular communication between meetings as well.*
- *For the Bureau of Bridges and Structures - The bridge design PMs participate in the overall MDOT PM Community of Learning. They are also provided training on in-house projects, and training modules developed in-house for bridge analysis programs, design detailing, etc. MDOT keeps bridge design related training materials accessible to all staff in ProjectWise.*

Performance Metrics

The metrics used to measure performance can differ between the oversight and production roles.

Q7. What specific metrics have you developed to assess the performance of outside consultants?

- *Competency in bridge design, knowledge of applicable standards (AASHTO LRFD, FHWA memorandum, etc.), proficiency in specification writing, quality management plans, etc. Standardized consultant evaluation and scoring process is completed at the end of every consultant contract.*

Q8. What specific metrics have you developed to assess the performance of state staff in an oversight role?

- *The same metrics as listed above.*

Additional notes:

In a follow-up email with additional questions from Romila Singh, Ms. Thelen explained the role of the Office of Human Resources (OHR) during the reorganization process that included a renewed focus on workforce planning activities:

“The MDOT Office of Human Resources (OHR) has been involved in the House. The OHR Director was the Business Area Contract Administrator for the House Consultant Contract with KS Goins and Associates. The OHR Director and a couple staff people also participated on a couple of the Builder Teams to build the pillars of the House. For example, the OHR Director was very involved with the Talent Review pillar design as he wanted to ensure the processes we put in place did not violate any performance management regulations with the Civil Service Commission. As far as implementation goes, we have OHR staff on several of the implementation teams as we recognize that their partnership is key to successfully implement the MDOT House. For example, OHR is very involved with the Employee Lifecycle phases of the MDOT House and the implementation that is occurring within each of the phases of the Employee Lifecycle.

You asked if OHR is involved in the Talent Review conversations. They are not involved with these. Our team of facilitators is careful to maintain the confidentiality of what is discussed in those meetings. It is possible there may be action items that come from the conversation that require a manager or work area to reach out to OHR, however, OHR are not part of work area conversations themselves.

Our office recognizes the importance of the OHR partnership in this and in addition the involvement I mentioned above, I have bi-weekly meetings with the OHR Director to ensure our offices are coordinating and partnering, to strategize, vision, etc. Also, the two managers that report to me also have monthly meetings with the OHR managers that report to the OHR Director.”

Funding – One thing we did not talk about that has been critical to the House and all the pieces of a successful Workforce and Succession Planning System is the use of federal 504e funds. These funds are 100% federal and are available to DOT's for workforce development. This funding sources funds our learning and development programs, our recruitment efforts, many of our workforce pipeline programs, etc.

MDOT House Talking Points – This document was prepared for the MDOT Leadership Team to learn and talk about the House with their work areas. The MDOT Leadership Team includes the Director, the Chief Deputy Directors, and the Region, Bureau and Office leadership as well. Each of these members signed a mortgage agreement for the MDOT House and are the owners of the House. The document provides a written overview of the House and the pillars.

WSPS Keys – This document is the keys to the MDOT House. It includes the pillar graphics and the definitions of each which is a high level summary about what each piece represents. We have printed these, connected them with a key chain and refer to them as the keys to the House.

Videos – Most of our education and roll-out about the House has been done with videos. We rolled these out internally, encouraged work areas to watch them as a group in staff meetings, talk about them, etc. so people understand what it is, why we are doing it, and why it matters to them. Here are links if you are interested:

Introducing The MDOT House: <https://www.youtube.com/watch?v=-YJTWqihOvI>

The House – Why: <https://youtu.be/zLVXNI1PBuU>

What is The MDOT House: <https://youtu.be/T4NSB3ETY5M>

The House – LSE: <https://www.youtube.com/watch?v=W061LIghtBY>

The House – RAM: https://www.youtube.com/watch?v=Jlfe1JN_Oss

The House – TRP: <https://www.youtube.com/watch?v=1Wjf3tikptM>

The House – KMS: <https://www.youtube.com/watch?v=9DYaHXiZ0gc>

The House – ELC: <https://www.youtube.com/watch?v=ESy6wllmiw>

In the Teams Meeting interview with the UWM-IPIT, Ms. Thelen in discussing their Leadership Standards of Excellence noted that: “We recognize as an organization that strong leadership is what makes a great work environment and that's where people want to stay. In order to have a workforce and succession planning system, a successful one that's working, we need to have leaders in place that care about leading people and not just because they're the experts in their field, but they have to really focus on our people.” Interviewees mentioned that it has been a cultural shift for MDOT “to really spend more time talking about our people focusing on our people and we do both because the business matters too.” They mentioned that in the past they “spent more time talking about the business at the leadership level.. and now we spend a lot of time talking about our people as well.” They also emphasized that their culture has been re-envisioned to be “People first, professional excellence and character and integrity.” It was mentioned that at the center of it all is “communication and that's one of the most important things” and it is the glue that holds the pillars together and making everyone accountable.

Further, it was mentioned that people being held accountable through the performance management. They are also holding their leaders accountable to these criteria mentioned in the Leadership Centers of Excellence and are hiring based off these criteria.

4.5 MISSOURI DOT PRE-INTERVIEW BACKGROUND INFORMATION FOR CONTEXT

“If possible, it would be helpful to have the following comparative information prior to our meeting. If no values are available, please just indicate the estimated magnitude of change in the comment column (e.g. “increased 10 %”, “stayed about the same”, etc.)

The information contained in this table was filled out by Missouri DOT and is shared here verbatim.

	2010	2020	Comment
Staffing in Operations (FTE)	*	3200	
Staffing in Engineering Services (FTE)		1200	
Size of Highway and Bridge program (construction contract \$)		1.1 Billion	
Percentage outsourcing of highway design		60 million/yr	
Percentage outsourcing of construction oversight		3 million/yr	
Percentage outsourcing of system operations (not design or construction)		Varies	

*MoDOT had a major downsizing between 2010 and 2020 of 1200 employees so comparisons would not be very helpful.

4.6 MISSOURI DOT: VIRTUAL TEAM MEETING INTERVIEW WITH ADMINISTRATOR: MR. ED HASSINGER (DEPUTY DIRECTOR)

SEPTEMBER 27, 2021

Internal and External Resource Management

Q1. Has your agency undergone any structural reorganizations to deal with workforce issues or to accommodate emerging needs in the services you provide? If so, how successful do you think these changes have been, and what would you possibly do differently?

Q2. Has your agency also experienced a gradual increase in outsourcing?

Q3. If so, what specific functions/skills have you tried to maintain in-house? Why, and with what degree of success? In other words, what are the most important functions that should continue to be performed by state staff, and why?

Q4. Where have you had the most success in outsourcing?

Q5. How have the roles of state staff changed in the transition from production to oversight?

- A combination of legislative decision, economic forces (e.g., 2008 downturn), and changes to the MoDOT's bonding program which had initially given them an influx of money, led to massive reorganization such that all of the 6300 employees that were there in early 2000s had to reapply for their positions and only a select few were then re-employed by MoDOT for the reorganization that took place in 2011-2012. Decisions were made to restructure in a way that programs had to match federal funds. Used financial forecasting to design an organizational structure. HR leadership was a driving force in helping with the reorganization.
- They eliminated three districts from the ten districts that did operational and program delivery. In addition, they also reduced maintenance facilities by 135 especially those that were sparsely staffed. During this process of reorganization, they did not reduce the number of boots on the ground as it related to operations but instead focused on reducing 135 supervisory personnel in maintenance areas and the administrative offices that supported them. In restructuring their organizations, they sized themselves to deliver \$650 million in revenues in 2010 dollars. They have grown to a billion-dollar organization and the ramp-up has been accommodated by outsourcing more rather than hiring more staff to do in-house work. Their internal capability was mentioned to be around \$750 million they outsource \$60-\$70 million a year of program delivery to "make up the delta." They are confronted with a "mass exodus of folks" (they are down 200 people in program delivery) and a stagnant compensation system that make hiring new professionals a challenge. It was acknowledged that generational differences in terms of what people value in civil engineering work is also constraining their ability to recruit for the open positions.
- They outsource more on the design side (particularly final design and most of the bridge work is outsourced because they have a "huge bridge inventory in Missouri and they are easy to define the scope of") and keep more of the oversight administration in-house. But they are very cognizant of the fact that they need to maintain a balance between outsourcing design work vs keeping some of it in-house so that they don't lose the critical ability to do it themselves and also to keep the consultants and contractors accountable. It was emphasized that they still hold the expertise in critical functions and can do it themselves. Another example of balance between outsourcing and in-house work is with respect to environmental jobs: a small in-house staff certainly has the capability to do the work but is not positioned to undertake mega-sized environmental projects and those are outsourced to consultants. They have had challenges in recruiting people, especially in urban areas. In the context of how this impact their responsible charge, it was mentioned that this was noted as a risk in their risk assessment.

Q6. Have you developed specific training programs to improve your staff's understanding of the oversight role and how to perform it?

- It was noted that in the design arena, they had fairly good metrics. Specifically, they have a consulting rating system and have liaisons that oversee parts of the business and help their districts with it. However, they admitted that the metrics on the contract administration side was not as robust.
- A few years ago, they created a brand new training program in the program delivery arena which includes a nuts to bolts training program for all the disciplines within MoDOT. Most of it is online with some in-person training for each type of role in the department. The training program includes a basic curriculum and discretionary curriculum for those like to go above and beyond and learn some new things. Some of the training material is created in-house and some of it includes information from the FHWA. Training is also tied to career progression. They career ladders in most of their disciplines, including field operations and even the entry level jobs. To be considered for promotion and progress up the career ladder, there's a checklist of competencies to demonstrate and training courses to finish before they are eligible for the step-up role. There's a financial incentive and a raise for these efforts as well. Training programs are tied to career ladders and demonstrated abilities and competencies.
- Cross-training is a common approach that is used, typically in larger districts. Cross-training has benefited both the agency and the people who do it. It's been a challenge to implement in smaller districts.
- **Succession Planning:** is tied to organizational structure itself and the training programs within it. They have programs in place for technical and production staff. For example, there is a program for advanced leadership training program which is 18-month cohort based program, and a maintenance leadership academy. These programs were a response to the presence of a separate succession planning process.
- **Knowledge Management:** They also have MoDOT U for different types of technical training. They experimented with LinkedIn Learning but found it inadequate for technical training. They have created a wiki page called Engineering Policy Guide (EPG: https://epg.modot.org/index.php/Main_Page) which provides a "single reference for all engineering and engineering-related Bridge, Construction, Design, Highway Safety & Traffic, Maintenance, Planning, and Right of Way Guidance" and is actively maintained at all times. It is also open to everyone and allows for public comment. In addition, the EPG wiki page also contains "several documents (internal and external) that can be signed with digital signatures through PDF editing software." As people are learning their jobs, they can use that wiki page for learning any facet of the organization's work. The EPG was created by the MoDOT staff.
- HR provides leadership and management training and all also carries out the basic HR functions like workforce planning, recruitment, retention etc. The HR team worked alongside with a consultant for reevaluating their strengths and weaknesses and they are currently working on implementing some of the recommendations like the specialized training programs mentioned during the interview.

Performance Metrics

Q7. What specific metrics have you developed to assess the performance of outside consultants?

- Consultants are rated using a form and those who do not perform well are “put on notice” to do better otherwise the relationship will not be renewed. Some of the work that they do involves an “on-call” agreement. In every district they have two or three consultants with whom they have a master agreement and which includes their hourly rate. Whenever they need to get any traffic, bridge design, and environmental type of work, they use the “on-call” contractors. It was stated that they start these arrangements with smaller contracts, and if the consultants don't perform very well, they are reviewed, given feedback, and their contracts may not be renewed. They contract “on-call” work within a variety of disciplines.

Q8. What specific metrics have you developed to assess the performance of state staff in an oversight role?

- In addition to the other measures discussed, they also noted creating a Performance Accountability Portal which is a public facing on their website and includes a number of metrics, such as the number of change order on a project and the extent to which it is above/below budget, to turnover numbers, as well as future projections of the workforce. So accountability is built into the performance metrics and is tied to the training piece discussed earlier.

Other notes:

Impending retirements, especially in leadership roles, low pay, but they balance it with a high level of commitment to the agency. Marketing MoDOT as an employer of choice has had limited success because they are so far below market in terms of compensation that people are getting worn out just waiting for any changes. They have a separate commission that examines their compensation. They don't have any merit compensation plan. As an example, their civil engineers are 20% below market pay against other public sector units, engineers start their pay in high 40s and maintenance workers are paid \$14/hour.

4.7 ANALYSIS AND IMPLICATIONS OF PEER DOT INTERVIEWS FOR WISDOT

There were several common features among the three peer DOTs that were profiled in this project. There were also unique, distinguishing features in each one that makes them noteworthy.

- All three DOTs faced similar internal pressures (or threats) such as staff attrition due to resignations and a high volume of retirements, challenging recruiting environment, stagnating compensation and performance based incentives, and a continual need to balance maintenance of critical in-house expertise versus pressures to outsource due to staffing and other challenges. The interviews did not reveal that any of the three agencies responded to these pressures with reorganization or restructuring any units. Missouri DOT had undergone a massive reorganization in the early 2010s and was still working with the same configurations. Minnesota DOT had undergone some restructuring, primarily the move to a shared services model and some shifts in offices within divisions but not any major shake-up. Michigan DOT addressed these challenges in the most systematic and systemic manner by going to the heart of the organization – its culture – and used a re-envisioned set of core values to completely overhaul their ‘people management’ aspects. As highlighted in their quote, they consciously decided to put people first, and at the same level as their business needs, implying that focusing on nurturing their talent using best HR practices would pay-off for the agency. Michigan DOT’s restructuring involved reconfiguring how their core values are enacted and implemented throughout the agency rather than tinkering with their organizational structure. See Appendix 4 for additional information on MDOT’s transformation.
- It appears that all three DOTs have outsourced a significant portion of their design work and yet each consciously balanced this by keeping some expertise in-house and using the in-house work to attract and retain employees.
- Each DOT had a formal HR department that was centralized and also had a presence at the district/regional level. A formal HR team at the central and district level was also present in MnDOT that moved to a shared services model several years ago. The HR teams/staff worked closely with the leadership at these agencies to provide guidance and implementation of core tasks. The staffing pressures were addressed by HR staff in partnership with agency leaders at different levels of the organization.
- All three DOTs had some form of workforce planning, succession planning, and knowledge management systems in place. The degree of comprehensiveness, formality, and reach varied, as did the extent to which it was systemically driven rather than being an ad hoc arrangement. MDOT exemplified a systematic and comprehensive approach to every aspect of workforce planning, succession planning, and knowledge management. In addition, they understood the links of all three of these activities to the broader recruitment and retention challenges. They ensured its sustainability by anchoring it within the culture and holding leadership at all levels accountable for supporting it.
- The three DOTs varied in their degree of formality and structure with respect to workforce planning, succession planning, and knowledge management. MnDOT had a structured workforce planning process that was integrated with its business planning and the strategic planning. It was carried out centrally and within districts. Both succession planning and

knowledge management were less structured and were confined to highly technical roles in certain positions. MoDOT integrated their succession planning and knowledge management with different types of technical and leadership training as well as presence of career ladders. Beyond cross-training and mentoring, MoDOT's knowledge management system included a unique feature in the form of a wiki that contained all policy guidance (except on HR) and is/was actively used and updated. MnDOT used knowledge books, interactive PPTs, and to a limited extent YouTube videos to document expertise that may be lost due to employee retirements or resignation. MnDOT also used double-filling a position as well as "temporary mobility assignments" to place an employee in a vacant role that would be part of their developmental portfolio and help in their career progression. This strategy served to delay hiring an external candidate while giving invaluable experience to internal employees outside their typical area. Both MnDOT and MDOT made diversity a conscious feature of their succession planning program. MDOT used a variety of knowledge management practices including mentoring, community of learners, and used Excel spreadsheets and Teams for actively collaborating across regions and divisions to share information, address challenges and brainstorm new ideas, and foster active feedback giving.

- MDOT stands out among the three DOTs for the manner in which they have integrated all key facets of an employee's life cycle into one framework (closely paralleling Josh Bersin's framework) and they approached it by anchoring it in their core values. In addition, all these activities are driven by HR staff working closely with the Office of Organizational Development and regional and bureau leadership. MDOT was the only DOT that engaged in regular (top-down and bottom-up) assessments of mission critical competencies and used that information for continually modifying their recruitment and retention plans. In addition, they continually used this information to inform their performance management and feedback process as well. In a nutshell, MDOT appeared to be doing everything in accordance with accepted best practices. Since they are still early in their implementation journey, time will tell how successfully these practices continue to unfold and sustain into the future.

Implications for WisDOT

Although these are many good to best practices profiled in these interviews that are worth emulating, it is important to first examine whether the practice(s) would be appropriate for WisDOT's culture and operational context. A sapling planted in the wrong soil or climate is unlikely to survive for long, let alone thrive. Likewise, installing a system or a practice without having the appropriate culture and leadership scaffolding in place to support the people enacting the practices may end up undermining the success of any new initiatives. All the practices highlighted in the interviews are intended to continue over the medium-to-long-term duration, and hence involve multiple layers of leadership and cross-district, cross-region collaboration, reinforced by the agency's core cultural values.

CHAPTER 5: NEXT STEPS AND RECOMMENDATIONS

While WisDOT's existing competencies are a good match for meeting the current work and project requirements, data analysis from this project has revealed that the current arrangement is not best suited to meeting the agency's long-term needs. Insights from the SWOT analysis revealed a tremendous potential for capitalizing on a multitude of IT and other infrastructure capabilities and strengths that the current staff possess by overcoming significant and pressing threats and weaknesses confronting the Division and the agency. The transportation landscape is evolving rapidly amidst an array of economic, demographic, technological, and legislative forces that exert an enormous pressure on the leadership of state DOTs across the country. Across the country, state DOT leaders are using different approaches to respond to these pressures. As revealed in the survey analysis of 45 state DOTs reported in the NCHRP report (2019), there may not be an overarching consensus on what exactly is entailed in workforce planning and development, but its importance as a strategic and essential activity for managing staffing challenges is indisputable. Likewise, the analysis of interviews from the three peer DOT's revealed a common approach to responding to the changing transportation landscape and internal staffing pressures by adopting a comprehensive workforce planning and workload management plan that was in some cases integrated with their business planning activities and coordinated by their HR leaders and staff. In addition, results from the core competency survey and root cause analysis undertaken by the DTSD team revealed an array of core activities that need to be further discussed and reframed in order for WisDOT to better position itself for successfully meeting its business needs.

Further, a review of the literature and insights gleaned from interviews with the three DOT agencies point out that any organizational structure redesign and ensuing change management effort needs to follow a strategic workforce plan that identifies the business drivers for reorganization and its implications for the envisioned success of the "three Ps": People, Processes, and Products. WisDOT, more specifically DTSD, has experienced, and continues to experience many of the same forces that have buffeted other DOTs and were identified in the NCHRP report (2012) highlighted in Chapter 1. The different organizational structures reviewed indicate that there is no one organizational ideal for WisDOT to model itself after. Instead, organizational restructuring could be thought as 'adapting' the organization's processes to be more responsive to addressing internal and external pressures. Any such adaptation efforts need to be rooted in the unique and defining features of WisDOT culture and need to simply and clearly articulate the vision/need and direction for change and its benefits and drawbacks. While there was not enough data available to recommend any restructuring options to WisDOT, the UWM-IPIT team provided an overview of the best practices and steps in the change management process that need to be followed for any adaptation/change effort to succeed.

Considering the insights gleaned from various sources and the best practices discussed in report, the following are recommendations to consider:

1. **Establish a formal office/team of staff trained to engage in strategic workforce planning and development activities:** The rationale for this recommendation stems from various sources of information presented in this report: best practices, interviews with

three peer DOTs, internal DTSD workforce analysis, core competency surveys and SWOT analysis. All these sources point to a significant need for DTSD (and possibly other Divisions) to strategically engage in workforce planning and development activities that are integrated with their business planning, forecasting, and budget formulation efforts. These planning efforts should be undertaken on an annual or biennial basis, to align the workforce needs of the Division with the business priorities and changing transportation landscape. Strategic workforce planning undertaken by this office should also involve participation by directors and mid to lower-level managers within the regions and bureaus. All these activities need to be undertaken by the division staff trained in workforce planning and development in conjunction with the leadership input and guidance from the Administrators' Office as well as from the regions and bureaus. Coordination with the DOA under the existing shared service model for recruitment, talent development, and retention plans may also be required. The PeopleSoft suite of tools currently used by DOA is equipped with workforce planning modules, but it is unclear if they are being used for WisDOT. Technological tools will serve to implement the strategic input from the AO's office, Directors' and Section Chiefs annual planning and development exercises. Finally, it is imperative that this team also conducts regular human capital analytics to assess its workforce planning and development actions. The OPM provide several workforce planning tools and templates for trend analysis on their website (<https://www.opm.gov/policy-data-oversight/data-analysis-documentation/>) As part of these efforts, the following should also be considered:

- a. **Develop/update core competency models** that are based on analysis of occupational priorities identified by latest Labor Market Information (LMI). The tiered core competency models developed by the US Department of Labor (DOL) for the Department of Transportation (DOT) jobs provide a classification of core competencies for each job classification used at state DOTs. Updating existing or developing job descriptions to include coverage of essential/emerging competencies can be undertaken by the new workforce planning team that will work in conjunction with the DOA. The 2019 report published by the National Network for Transportation Workforce (NNTW) Career Pathways Initiative used the occupational priorities outlook and the LMI to develop sample core competencies for a variety of transportation engineering jobs such as highway maintenance engineer, construction manager, civil engineer, civil engineering technicians, etc. These core competency classifications were developed by the Midwest Transportation Research Center (MWTC) housed at UW-Madison which was a regional NNTW center at the time their report was published but it has ceased its operations since then. What is noteworthy about this project undertaken by the MWTC is that this initiative is about much more than establishing current core competency models; it is also about making visible the *“invisible career option for prospective students, ... parents, and guidance counselors”* and *establishing a pathway from K-12 education to transportation engineering jobs in the state DOTs and other transportation employers.*” (p. 186). They have built a *“career pathway that is visible to students and parents, connected this*

apprenticeship to Civil Engineering Technician and Highway Maintenance Management programs, and have developed materials to assist employers in building apprenticeships in their own communities to facilitate the emergence of a workforce ready to transition into a sensor-based, AI world.” (p. 187). It is important to note that the MWTC at UW-Madison is no longer operational. The core competency survey developed by the DTSD team focused on identifying mission critical activities and would complement the core competencies to be developed/updated by the new team would be reflective of employee capabilities in terms of knowledge, skills, and abilities.

- b. **Conduct regular wage surveys** to inform strategic workforce planning efforts. As pointed out in one of the DOT interviews, if the starting pay for a vacancy is so below what is competitively offered at other public sector agencies, then that information needs to be proactively addressed instead of adding more failed recruitments. Another DOT interviewee discussed addressing this challenge head-on by using “temporary mobility assignments” to address recruiting challenges to fill vacant positions. In addition, wage surveys will also keep the agency ready with data when the legislature votes on any compensation plans.
 - c. **Turnover analysis** should be regularly conducted to understand who is leaving (broken down by demographics), why they are leaving, and the costs associated with their departure, including costs of hiring, on-boarding, and training replacements. Society for Human Resource Management (SHRM) has several turnover cost calculators specific to different job classifications and geographical locations that are available for the members to use. Many professionals engaged in workforce planning efforts have membership with the organization and use their tools and templates.
 - d. **Workforce planning metrics** need to be collected and analyzed on a regular basis for adequate forecasting. In addition to turnover analysis, the following metrics need to be collected and factored into the planning: such as time-to-fill a vacancy, skill-gap rate that provides a 5-year “look-ahead” for skills gap and a 5-year “look-ahead” for requirements, supervisory ratio, bench-strength ratio that provides a ratio of trained or in-training employees to step into a vacant leadership role, and FTE to consultant ratios.
 - e. **Employee engagement/satisfaction surveys** should be factored into strategic workforce planning and development efforts. This is critical to understanding which features of the workplace culture and environment are driving (dis)engagement/(dis)satisfaction. In a total or partial remote working environment, these surveys should explicitly examine how these arrangements are impacting collegiality, communication, and collaboration.
2. **Succession planning and knowledge management should be aligned with strategic workforce planning and development plans.** The rationale for this recommendation comes chiefly from best practices highlighted in the report as well as the interview data. Any efforts to *systematically* and *systemically* address the workforce gaps, and weaknesses and threats identified by the SWOT analysis should tightly integrate

succession planning and knowledge management practices with strategic workforce development plans. The integration of these activities should reflect current and anticipated competency gaps that can be addressed internally and/or externally. In addition, a vital component of addressing competency gaps involves examining current workload management practices and reevaluating them to prevent misalignment with the requirements for fulfilling business objectives. The importance of updating and streamlining workload management practices is also evident from the perspective of broad employee retention efforts. Inadequate and misaligned workload management practices have been associated with low employee morale, disengagement, stress, and intentions to leave the organization.

- 3. Retention practices should be re-envisioned to align with strategic workforce planning and development needs:** This recommendation stems from multiple sources of information and data analysis. In particular, Michigan DOT provides an excellent model for the WisDOT implementation team to consider as they explore different options to align retention strategies with the agency's core cultural values – People, Processes, and Products. Some of the retention practices to consider are:
- a) **Core competency training:** Training was an important issue that was highlighted in all the interviews as well as in the SWOT analysis. Clearly, training in core competencies needs to be improved. In addition to technical skills training in areas identified in the SWOT analysis, it is critical for the Division to also focus on training in management skills such as giving effective performance feedback to subordinates and consultants, effective communication skills, specific technical skills, and leadership skills. There should also be a renewed focus on cross-functional training to address succession planning needs, competency gaps, etc. Toward these ends, the implementation team could consider:
 - i) **Greater partnership with university affiliated transportation centers** for training, research, skill enhancement workshops, seminars, conferences, etc.
 - ii) **Greater use of FHWA training and education funds** that are available under 23 USC 504 for workforce development initiatives.
 - iii) **Establish Pilot Communities of Practice (CoP)** for employees to share best practices and lessons learned as a precursor to establishing CoP in a more formal knowledge management program.
 - b) **Career/professional development programs:** The importance of career and professional development programs figured prominently in the SWOT analysis and in discussions with the peer DOTs. Any retention efforts should add professional and career development activities through innovative programming in addition to the traditional mainstays such as formal/informal mentoring and coaching programs. Mentors need to be explicitly recognized and rewarded for engaging in these activities. To the extent possible, developing people either through formal/informal mentoring or coaching could potentially be added as a work role requirement for mid to senior level leaders.

REFERENCES

- AASHTO CTE Annual Meeting, Workforce Development, June 7 2021: PDF of PowerPoint available at: <https://traffic.transportation.org/wp-content/uploads/sites/26/2021/08/Workforce-Development.pdf>
- Cronin, C.B., Alexander, A., Cronin, B., Riches, C., Stern, J., Lazaro, R., & Lazaro, V. (2013). Building a Sustainable Workforce in the Public Transportation Industry—A Systems Approach, Transit Cooperative Research Program (TCRP) Report 162, 297 pp. Published by Transportation Research Board, Washington.
- Dobru, D. F., Hewes, C. Simon, P. & Welchman, T. (Sept. 20, 2021). Operating Model Transformation: Not all elements are created equal. *McKinsey & Co.* People and Organizational Performance Blog
- Emmerichs, R. M., Marucm, C. Y., & Robbert, A. A. (2004) An operational process for workforce planning. Rand Corporation.
- Good, L. & Buford, E. (March 2021). Modernizing and Investing in Workforce Development. Corporation for a Skilled Workforce. Report available at: <https://skilledwork.org/wp-content/uploads/2021/03/Modernizing-and-Investing-in-Workforce-Development.pdf>
- Hancock, B. & Schaninger, B. (July, 2020). HR says talent is crucial for performance – an the pandemic proves it. *McKinsey Quarterly*, July 2020, 1-7.
- Hancock, B., Lazaroff-Puck, K., & Rutherford, S. (2020). Getting practical about the future of work. *McKinsey Quarterly*, January 2020, pp. 1-8.
- Hancock, T. (December 2020). Workforce Planning the age of Covid. Society for Human Resource Management. *HR Magazine*. Available at: <https://www.shrm.org/hr-today/news/hr-magazine/winter2020/Pages/workforce-planning-in-the-age-of-covid.aspx>
- National Academies of Science, Engineering, and Medicine. (2019). Transportation Workforce Planning and Development Strategies. Washington, DC. The National Academies Press. <https://doi.org/10.172226/25624>
- National Academies of Sciences, Engineering, and Medicine (2009). Tools to Aid State DOTs in Responding to Workforce Challenges. Washington, DC: The National Academies Press. <https://doi.org/10.17226/14247>
- National Academies of Sciences, Engineering, and Medicine (2021). Resource Guide for Improving Diversity and Inclusion Programs for the Public Transportation Industry. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26230>.
- National Network for Transportation Workforce (2019). National Transportation Career Pathways Initiative Final Report. DTFH6116H00030, CSULB Research Foundation, 006199129 / 956106694, Final Project Report. FEB 2019. Report available at: <https://www.nntw.org/wp-content/uploads/2020/04/NTCPI-Year-Two-Report-final.pdf>

NCHRP Domestic Scan 20-68D US Domestic Scan Program: Leading Practices in Strategic Workforce Management by Transportation Agencies” Findings, Conclusions and Recommendations. Report not yet published. PDF of PowerPoint available at: <http://depts.washington.edu/pactrans/wp-content/uploads/2021/04/Scan-19-02-presentation-to-PACTRANS-APR-2021.pdf>

NCHRP Report 20-24 (83) (2012). Alternative DOT Organizational Models for Delivering Service 2012. Report available at: [https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-24\(83\)_FR.pdf](https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-24(83)_FR.pdf)

Office of Inspector General Audit Report (2014). US DOT FHWA’s Workforce Planning Processes Generally Align With Best Practices, but Some Components Are Inconsistently Implemented or Lack MAP-21 Consideration Federal Highway Administration, Report Number MH-2014-058.

Panagiotou, G. (2003). Bringing SWOT into focus. *Business Strategy Review*, 14(2): 8-10.

US Department of Transportation Human Capital Management Guide to Workforce Planning (2008).

Websites Referenced in Chapter 3:

https://www.fhwa.dot.gov/innovation/everydaycounts/edc_6/docs/swd_factsheet_edc6.pdf

<https://www.fhwa.dot.gov/policy/otps/pubs/impacts/>

<https://transweb.sjsu.edu/sites/default/files/1893-Godfrey-Attract-Retain-Women-Transportation.pdf>

https://www.transportation.org/wp-content/uploads/2018/09/braceras_emphasis_areas_092718.pdf

<https://www.memphis.edu/setwc/womenintransportation.pdf>

APPENDIX 1

DTSD TEAM’S STRATEGIC PATHWAYS CORE COMPETENCY SURVEY

The following represents the questions asked by the DTSD team to assess the adequacy of current allocation of personnel resources for fulfilling mission critical activities in each bureau and region:

Q. 1: In the following areas, how important is it for WisDOT to maintain internal expertise? (1 = not important, 10 = very important)	1 2 3 4 5 6 7 8 9 10 Low High
<i>Planning</i>	Importance Rating
List of Mission Critical Activities 1-5: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Region Operations</i>	Importance Rating
List of Mission Critical Activities 1-14: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Structures (PDS and OPS)</i>	Importance Rating
List of Mission Critical Activities 1-5: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Traffic Operations</i>	Importance Rating
List of Mission Critical Activities 1-4: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Highway Maintenance</i>	Importance Rating
List of Mission Critical Activities 1-4: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Project Development</i>	Importance Rating
List of Mission Critical Activities 1-12: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Technical Services</i>	Importance Rating
List of Mission Critical Activities 1-16: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Region PDS</i>	Importance Rating
List of Mission Critical Activities 1-3: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>TSS</i>	Importance Rating
List of Mission Critical Activities 1-17: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	

<i>OBOEC</i>	Importance Rating
List of Mission Critical Activities 1-3: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Administrator's Office</i>	Importance Rating
List of Mission Critical Activities 1-3: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	

The following question was used to assess the respondents recommendation for the percentage of activities that were necessary to kept in-house for the agency to fulfill its mission.

Q. 2: In the following areas, what percent of the program must WisDOT keep in order to maintain internal expertise? (1 = 10%, 10 = 100%)	1 2 3 4 5 6 7 8 9 10
<i>Planning</i>	Recommended %
List of Mission Critical Activities 1-5: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Region Operations</i>	Recommended %
List of Mission Critical Activities 1-14: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Structures (PDS and OPS)</i>	Recommended %
List of Mission Critical Activities 1-5: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Traffic Operations</i>	Recommended %
List of Mission Critical Activities 1-4: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Highway Maintenance</i>	Recommended %
List of Mission Critical Activities 1-4: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Project Development</i>	Recommended %
List of Mission Critical Activities 1-12: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Bureau of Technical Services</i>	Recommended %
List of Mission Critical Activities 1-16: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Region PDS</i>	Recommended %

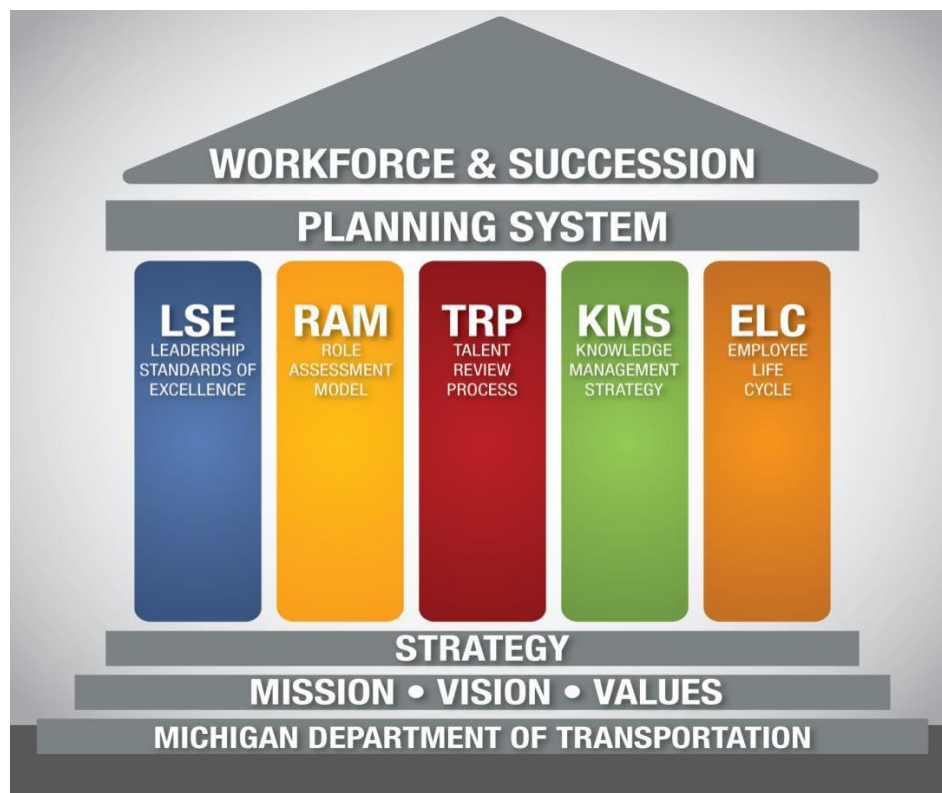
List of Mission Critical Activities 1-3: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>TSS</i>	Recommended %
List of Mission Critical Activities 1-17: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>OBOEC</i>	Recommended %
List of Mission Critical Activities 1-3: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	
<i>Administrator's Office</i>	Recommended %
List of Mission Critical Activities 1-3: description of each activity was accompanied by the current FTE allocation for that activity and the current percentage of activity that was approximately outsourced	

APPENDIX 2

ROOT CAUSE ANALYSIS FORMAT USED BY THE DTSD TEAM

		Department Mission/Vision/Values (Rating: Yes/No)	Division Pillars (People, Process, Partnerships) (Rating Scale: -4 to +4)	Guiding Principles (Divisional Approach, Consistency, DEI, Roles/ Responsibilities, Local Presence, Specialization vs Generalization, Staff/Mgmt. Ratio, Teams/Org Ratio) (Rating Scale: -4 to +4)	Strengths List (Rating Scale: -4 to +4)	Weaknesses List (Rating Scale: -4 to +4)	Threats List (Rating Scale: -4 to +4)	Opportunities List (Rating Scale: -4 to +4)	Additional Factors List (Rating Scale: -4 to +4)
Root Causes									
	Structure								
	Systems								
	Process								
	People								
Organizational Scenarios									
	Scenario 1								
	Scenario 2								
	Scenario 3								
	Scenario 4								

Workforce & Succession Planning System: The MDOT House *Talking Points*



A system is a set of connected things, working together, forming a complex whole.

MDOT's Workforce & Succession Planning System (WSPS) includes five pillars, working together as a system, to ensure that MDOT has employees that are equipped and ready to support MDOT's operations, both now and in the future. Each "pillar" of the house is a critical component in MDOT successfully executing on its strategy. We call the entire system, "The House." "The House" reflects One (unified) MDOT, and each employee is a resident in this house. "The House" operates according to standards and processes that support professional development, career opportunity, performance accountability, and effective management of our intellectual capital. Each pillar in "The House" is like a load bearing wall – all five of them are essential to make sure our MDOT House stands strong, now and in the future.

MDOT's strategic direction is rooted in our Mission, Vision and Values.

MDOT Mission

Providing the highest quality integrated transportation services for economic benefit and improved quality of life.

MDOT Vision

MDOT will be recognized as a progressive and innovative agency with an exceptional workforce that inspires public confidence.

MDOT Values

Quality

Achieving our best within our resources.

Teamwork

Effective involvement of people.

Customer Orientation

Knowing our customers and understanding their needs.

Integrity

Doing the right thing.

Pride

In MDOT and the importance of our work.

Without you, there is no us

MDOT's Strategy for Workforce & Succession Planning is based on MDOT's Mission, Vision and Values. MDOT's Mission is delivered by its people. To achieve our Vision of having an exceptional workforce, we must be intentional and have systems in place that enable that outcome. Our Strategy for Workforce & Succession Planning or "The House," describes how MDOT plans to respond to present and future changes, as well as trends in the industry. When senior leaders see new changes or shifts in the industry, they will need to ensure MDOT's strategy shifts and adjusts to effectively respond to those changes. When MDOT's Strategy shifts, each component within "The House" will also need to be assessed and adjusted to ensure ongoing alignment to the strategy.

MDOT Leadership Standards of Excellence



MDOT’s Leadership Standards of Excellence (LSE). In consideration of industry trends and future changes that could impact MDOT’s operations, it is evident MDOT needs a cohesive and shared definition of what we expect from our leaders, those who manage others.

Leaders are and should be held to a higher standard. Other employees should strive for these standards as well, especially if they aspire to be leaders one day. However, it is required for leaders and managers.

MDOT’s Leadership Standards of Excellence (LSE) also provides standards and guidance on the type of leaders we want to recruit and hire, enabling us to be consistent in setting expectations of new leaders and managers on “Day One.” This will be important for performance and accountability.

The Leadership Standards of Excellence clarify what skills, competencies, and behaviors will be essential for all leaders to demonstrate to ensure our current and future success. Those skills, competencies, and behaviors were categorized into 5 areas: Visionary, Ensure Positive Outcomes, People First, Professional Excellence, and Character and Integrity.

These categories and their supporting standards and actions will be critical for MDOT's current and future success and will be a performance expectation of all leaders of people.

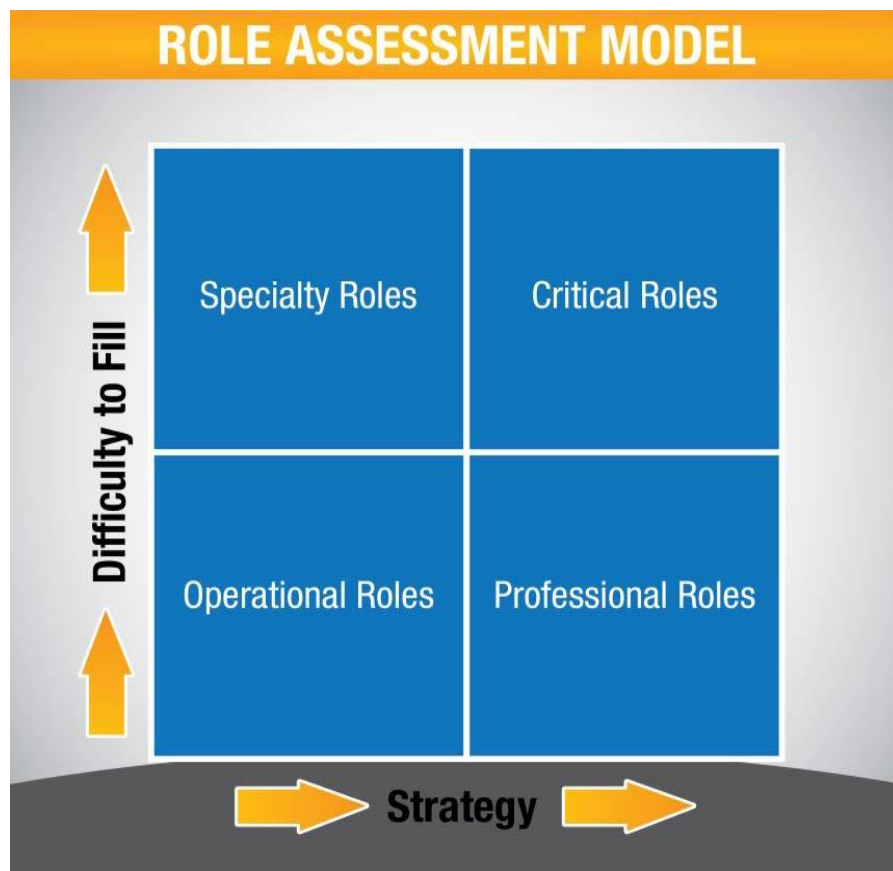
These standards will be integrated into MDOT's culture in the following ways:

1. These Leadership Standards of Excellence will be foundational to our leadership trainings and development efforts. They will guide the types of training leaders attend and highlight skills that leaders will be expected to develop and enhance.
2. These Leadership standards will be embedded in our recruitment efforts for leadership roles. As we recruit and hire candidates who will fill leadership roles, we will screen for and select people that demonstrate the capability of leading according to MDOT's Leadership Standards of Excellence.
3. We will also begin to integrate these standards within our existing leadership ranks via a Talent Review Process where the leaders (Level 15 and above) will be assessed on these Leadership Standards of Excellence. Their strengths and development areas will be noted and they will be expected to put plans in place to strengthen development areas.

What you can do relative to these Leadership Standards of Excellence today:

1. Read them. Highlight 2-3 areas that you would identify as things you do well. Next, highlight 1-2 areas that you need to strengthen and develop. Be prepared to share your personal assessment with your direct manager/supervisor.
2. If you are a manager/supervisor of another manager/supervisor, you should complete Step 1. Then, assess each of your direct reports who are also managers/supervisors. Schedule time with each of them to understand their assessment, share yours, and agree on 1-2 areas that the employee will commit to developing and strengthening.

Role Assessment Model



Role Assessment Model (RAM). This pillar focuses on positions, not the people performing them. The question that is asked in considering the various roles within MDOT is, "What foundational skills, knowledge, and expertise will MDOT need to have (that are currently gaps for us today) to address current and future challenges?" This question should regularly be asked by MDOT leaders, and the answers to that question can both validate our current roles and help us identify additional roles that would be required to help us address current and future challenges (i.e. new IT and Organization Development roles).

Ultimately, the goal of RAM is to ensure MDOT's positions are clearly defined, efficiently designed, and optimally utilized to meet the needs of the organization. Having a greater understanding of the skills, knowledge, and expertise required by each of our positions and how they contribute to the agency's success helps us understand how to recruit, develop employees, and use the right knowledge transfer tools to ensure we retain intellectual capital.

RAM looks at all roles within the department and organizes them into 4 categories: Critical Roles, Specialty Roles, Operational Roles, and Professional Roles. **It is important to understand that all MDOT roles are essential to our ability to operate now and get to our future state.**

The categorization of different roles helps us focus our strategies for recruitment, training, knowledge management and other activities in the employee life cycle to be most effective. Thinking about the roles in these categories positions us to ensure that all roles are being fulfilled now and will be in the future.

Critical Roles – These roles are most closely aligned to the strategy and are difficult to find. These roles are key to our ability to successfully operate in the future.

Professional Roles – These roles are most closely aligned to the strategy and play a key role in helping the agency accomplish strategic objectives (HR, Legal). However, they are not hard to find in the marketplace. The skills needed for these roles are transferable across industries.

Specialty Roles – While less aligned to the strategy, these roles are difficult to come by due to the significant subject matter expertise required. These roles stabilize the agency and are key to MDOT's ability to successfully operate "right now."

Operational Roles – The roles are key to ongoing operations (current and future state) regardless of shifts in strategy. We will always need these roles, and they are easier to find in the market.

How does the role assessment model impact me?

1. There are no specific actions you need to take regarding this model
2. However, it is important that you know this model should serve as a tool to provide focus and improve the efficiency of your role as it helps us to make key distinctions about how the role is best utilized. When we can distinguish strategy-focused roles (Critical and Professional Roles) from operational-focused roles (Specialty and Operational Roles), it enables us to effectively manage our time and energy. For instance, employees who are in roles classified as operational roles should make sure they aren't spending the majority of their time in meetings while people in strategy roles should make sure they are spending enough time planning and thinking.

3. Additionally, distinctions can be made based on the difficulty to fill roles. Hard-to-fill roles are classified as either Specialty or Critical Roles while roles that may be more available in the market are classified as either Operational or Professional roles. When we can make distinctions between these two kinds of roles, it enables us to make better decisions regarding our recruitment efforts and knowledge transfer needs.

Talent Review Process



Talent Reviews are consistent conversations held by leaders to talk about the state of our talent at MDOT. These consistent conversations allow leaders across MDOT to assess the strength of our employee base, calibrate or align on how leaders view and assess employee performance, and collectively identify ways to strengthen and develop our workforce.

Conversations, Consistency, and Calibration produce an *Intentional Culture* where employee development is positioned at its core. Effective Talent Reviews, where leaders are candid and committed to the process, can foster a culture that values employees while creating an environment where employees can grow and develop, as well as effectively manage their careers.

About the Talent Review Process (TRP). Talent Review discussions will be formally held twice each year. One discussion will occur in the Spring, and the second discussion will occur in the Fall.

During the Spring meeting, leaders (participants) will get in-depth insight of employees' individual performance – what they have accomplished relative to their annual goals and how they operate with respect to the Leadership Standards of Excellence (LSE).

The Fall meeting is designed to discuss their area's progress relative to culture, staffing metrics, performance progress, and development having occurred since the previous year's Fall Talent Review.

The Talent Review Process has multiple benefits for the department.

TRP Benefits to Managers:

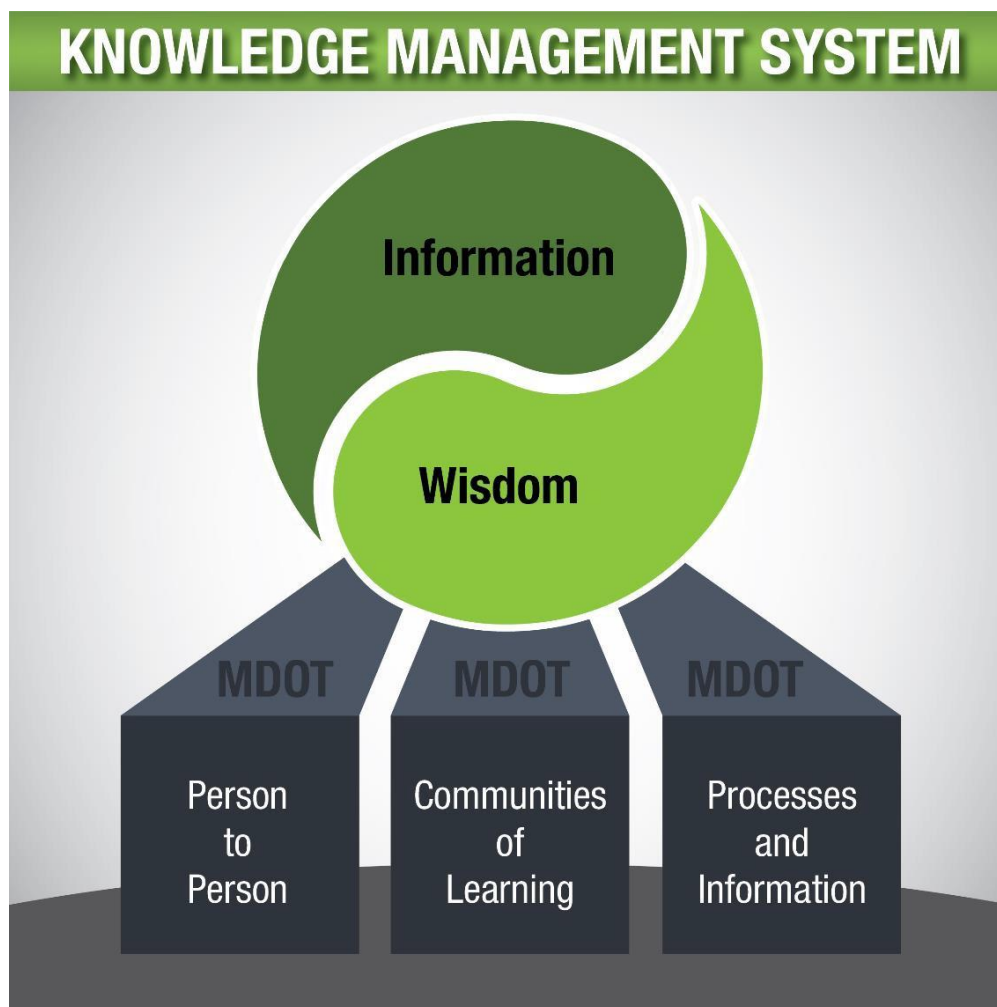
- Better inventory of work unit skills, competencies, and needs
- Framework for evaluating and communicating performance progress with employees
- Ensures consistent expectations and measurement across the agency

TRP Benefits to Employees:

- More honest, open opportunity for dialogue
- Managers provide guidance for professional growth and development
- Performance and accomplishments acknowledged on a broader scale

Each leadership group in the bureaus, regions and offices are receiving training during the Fall and Winter of 2018-19. The first round of talent reviews will occur in 2019 and will be facilitated to help each area learn and perform the review with success.

Knowledge Management System



Knowledge Management is the continuous practice of capturing, sharing and applying knowledge and information. It is the process of ensuring wisdom and information intentionally and purposefully flow within and across MDOT. We want our intellectual capital to stay within MDOT and to be readily accessible to employees.

For MDOT, knowledge can be viewed as the following:

- Knowledge may include what consists in one's brain by way of years of experience, knowledge accumulated over time and gained by trial and error, what we consider *wisdom*.
- *Information* is what can be documented or written. This would include processes and systems
- Knowledge transfer is the action associated with sharing knowledge, both wisdom and information.

People's ability to learn and retain knowledge, whether information or wisdom, generally follows the 70/20/10 principle.

- 70% of what we retain comes from hands-on learning; on the job experience or other challenging assignments.
- 20% of what we retain comes from developmental relationships (informal or social learning)
- 10% of what we retain comes from formal training classes and program. It is most effective when it happens immediately before the knowledge is to be applied on the job.

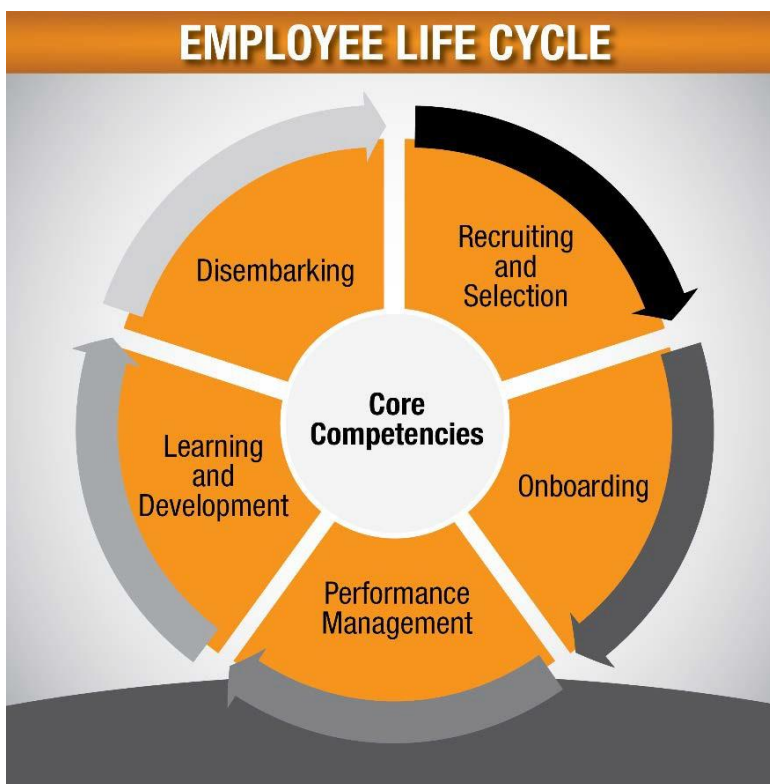
The Knowledge Management System (KMS) has been designed with three distinct legs: **Person to Person, Communities of Learning, and Processes and Systems**. Each leg has activities, systems and procedures that support one another. The KMS will help manage knowledge in the department and minimize risk. It will help us eliminate single person dependencies while focusing on employees as teachers and sharers of wisdom. In addition, employees will experience new and fun ways to learn while having access to information needed to do their jobs well.

Person to Person - This leg focuses on information and wisdom that is transferred from one person to another. It is focused on specific incidents where it is important we intentionally transfer information and wisdom directly to ensure the effectiveness of the individual and the agency. A process for information flow is designed to be between two people.

Communities of Learning – This leg focuses on individuals and groups of people sharing knowledge and information in a variety of ways. It adds structure to the ways we share with and learn from one another.

Processes and Systems- This leg focuses on our systems and processes - what and where information is stored and how it is accessed. As time progresses, it is important we can track and access established processes as well as lessons learned. It is also important that information is stored whereby we can find it quickly and easily.

Employee Life Cycle



The **Employee Life Cycle** is where and how our employees experience all the efforts made and time invested in establishing and aligning the other four pillars. In order for this work to yield positive results, MDOT must commit to ensuring all employees have a consistent, meaningful, and cohesive experience.

Having consistent Leadership Standards of Excellence, understanding the unique value of all of our roles (RAM), consistently monitoring and developing the state of our employees' skills (TRP), and ensuring we have a culture that facilitates ongoing knowledge transfer (KMS) positions MDOT to effectively manage the life cycle of our employees with excellence and create advocates for our organization.

1. Our Recruiting/Selection efforts ensure we are attracting the *right people* for each role and are hiring people who share our values and standards.
2. Our on-boarding enables new employees to get started on the *right foot* to learn about and become integrated into the organization.
3. Our Performance Management Process supports employees getting focused on the *right things*.

4. Learning & Developing enables employees to grow their career in the right way and prepare themselves for the right role, both their current and future roles along their career path.
5. Disembarking (off-boarding) ensures employees leave us in the right way – continuing to highlight MDOT as a best in class employer.

Building “The House”

For the past year we have been shifting our strategic direction to focus more on Workforce and Succession Planning. Teams involving a broad range of MDOT employees have been working with an organizational development consultant to develop the “MDOT House” described above. Now it is time to implement this new structure and begin occupying our remodeled and improved house. Over the course of the next several years, elements of the five pillars will be brought on line with the help of everyone in the department.

Care and Keeping of “The House”

Like any home, everyone plays important roles in taking care of the “MDOT House.” At the same time, for us to be successful over the long term, it will also be necessary to ensure we have an adequate support structure around us to help ensure we are fulfilling our roles and responsibilities and sustaining the momentum that has been started. To that end, we’ve decided to consolidate many of the functions we currently do around recruitment, training, employee development, and performance excellence into a single Office of Organizational Development. Doing this will help us better align our efforts in support of the strategic direction we are taking for Workforce and Succession Planning.

This new office includes a new leadership position, an Organizational Development Officer. We certainly don’t take the establishment of another senior management position lightly. However, if we’re going to get this right, we need someone at the helm of these efforts who will be a peer of the Leadership Team, so that everything we do in Workforce and Succession Planning will have equal footing with all the other business of the department. The position will report to the Chief Operations Officer but will be responsible for organizational development activities for the entire department.

In addition, transition teams for each pillar will be established. As subsets of the team who developed each pillar, they will share knowledge (both information and wisdom), help this new office and the Organizational Development Officer understand the background and intent of the elements in each pillar, and help ensure their success. A communications team will also be formed to craft strategies to help all of us better understand our “MDOT House” and continuously remind ourselves of what it means to be part of this household.