

IRINA A. CHINDEA, SUSAN M. GATES, KATHERINE C. HASTINGS,
JENNIFER LAMPING LEWIS, EMMI YONEKURA, SAMANTHA CHERNEY,
CHRISTINE DEMARTINI, MOLLY DUNIGAN, JONAH KUSHNER,
BARBARA BICKSLER

Creating Readiness Metrics for the Army Civilian Workforce

A Way Ahead for Integrating Readiness into Civilian
Workforce Planning



For more information on this publication, visit www.rand.org/t/RRA2225-1.

About RAND

The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. To learn more about RAND, visit www.rand.org.

Research Integrity

Our mission to help improve policy and decisionmaking through research and analysis is enabled through our core values of quality and objectivity and our unwavering commitment to the highest level of integrity and ethical behavior. To help ensure our research and analysis are rigorous, objective, and nonpartisan, we subject our research publications to a robust and exacting quality-assurance process; avoid both the appearance and reality of financial and other conflicts of interest through staff training, project screening, and a policy of mandatory disclosure; and pursue transparency in our research engagements through our commitment to the open publication of our research findings and recommendations, disclosure of the source of funding of published research, and policies to ensure intellectual independence. For more information, visit www.rand.org/about/research-integrity.

RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

Published by the RAND Corporation, Santa Monica, Calif.

© 2023 RAND Corporation

RAND® is a registered trademark.

Library of Congress Cataloging-in-Publication Data is available for this publication.

ISBN: 978-1-9774-1153-2

Cover: photo by Amy Christopherson.

Limited Print and Electronic Distribution Rights

This publication and trademark(s) contained herein are protected by law. This representation of RAND intellectual property is provided for noncommercial use only. Unauthorized posting of this publication online is prohibited; linking directly to its webpage on rand.org is encouraged. Permission is required from RAND to reproduce, or reuse in another form, any of its research products for commercial purposes. For information on reprint and reuse permissions, please visit www.rand.org/pubs/permissions.

About This Report

This report documents research and analysis conducted as part of a project entitled *Measuring the Readiness of the Army Civilian Workforce*, sponsored by the Assistant Secretary of the Army for Manpower and Reserve Affairs. The purpose of the project was to develop metrics for assessing readiness levels for the Army civilian workforce.

This research was conducted within RAND Arroyo Center’s Personnel, Training, and Health Program. RAND Arroyo Center, part of the RAND Corporation, is a federally funded research and development center (FFRDC) sponsored by the United States Army.

RAND operates under a “Federal-Wide Assurance” (FWA00003425) and complies with the *Code of Federal Regulations for the Protection of Human Subjects Under United States Law* (45 CFR 46), also known as “the Common Rule,” as well as with the implementation guidance set forth in DoD Instruction 3216.02. As applicable, this compliance includes reviews and approvals by RAND’s Institutional Review Board (the Human Subjects Protection Committee) and by the U.S. Army. The views of sources utilized in this report are solely their own and do not represent the official policy or position of DoD or the U.S. government.

Acknowledgments

We would like to thank the Army and U.S. Department of Defense employees and contractors who participated in interviews associated with this study, sharing their perspectives and expertise with us. This study would not have been possible without their input. This report also benefited from engagement with and feedback from our study sponsors and members of the Army’s Civilian Implementation Plan working group focused on civilian readiness: Todd Fore, Maria Ciepiela, John Bott, and Marko Mocevic. We also benefited from input from Major Camille Betito and Major Stephanie Bullock, who were assigned to the RAND Corporation in fiscal year 2022 as Army Fellows and were members of this project research team. We would also like to thank RAND colleagues Larry Hanser and Pete Schirmer for sharing their expert insights on defense workforce readiness issues and potential data sources; John Drennan for his key role in developing the interview protocol and supporting the literature review efforts; Al Robbert from RAND and Dan L. Ward of RevTech Solutions for their valuable reviews of an earlier draft of this report; and Daphne Rozenblatt for editing the final copy. Any errors are the responsibility of the authors.

Summary

The Army's civilian workforce plays a critical role in supporting the Army's mission. U.S. Department of Defense (DoD) and Army policy have focused on workforce planning, management issues, and, more specifically, the contributions of the civilian workforce to strategic readiness, which has increased interest in the concept of civilian workforce readiness and how it might be measured. In this context, the Army asked the RAND Arroyo Center to develop a method for measuring the readiness of its civilian workforce. This method would be grounded in a definition of Army civilian readiness that could inform policies and practices related to sizing and management of the Army civilian workforce, along with metrics for assessing its readiness.

In conducting this research, we reviewed relevant research literature and policy documents related to workforce readiness, conducted interviews with stakeholders across the Army and DoD, developed a logic model that both reflected our definition of civilian workforce readiness and supported the identification of promising readiness metrics, and reviewed U.S. government databases to identify potential sources of data that could be used to measure civilian readiness.

Defining Army Civilian Workforce Readiness

Our research revealed that the Army (and DoD more generally) lacks an articulated definition of civilian readiness. Our literature review, policy review, and interviews pointed to some consensus on key features of such a definition: It should be grounded in requirements for the positions and the people who fill them; support both a current and future-oriented perspective; and be applicable at the individual, functional, organizational, and enterprise levels. After synthesizing information from these sources, we proposed a working definition of *civilian readiness* that resonated with those we interviewed:

Civilian readiness can be defined as the state of having the right number of people with the right set of skills, competencies, resources, and experiences in the right job at the right time to support an Army capability.

This definition of civilian readiness can be applied at the individual, functional, organizational, and enterprise levels and can be considered from a short-term and future-oriented perspective. The short-term perspective focuses on the question of whether the Army has the right workforce today to meet current needs. The future-oriented perspective focuses on whether the Army is poised to have the right workforce in the future to meet future needs. Similar to the military's codified definitions of operational and strategic readiness, a definition of civilian workforce readiness that is well-coordinated and has obtained consensus is essential for developing readiness metrics for this workforce.

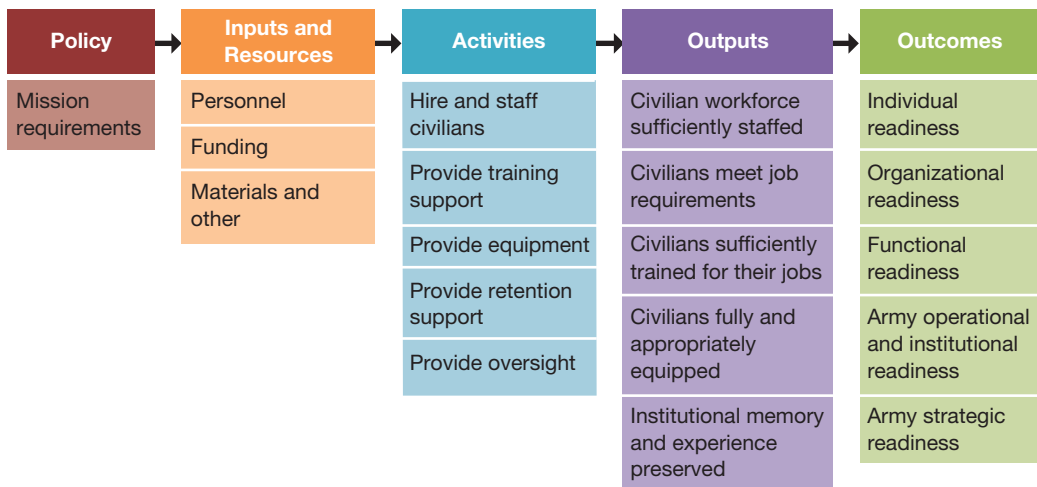
Army Civilian Workforce Readiness Framework

We developed a logic model as a framework for thinking about both readiness definitions and the processes and structures that support and facilitate the tracking of readiness. The logic model, shown in Figure S.1, graphically depicts the relationship between policy, inputs and resources, activities, outputs, and outcomes that are related to the readiness of the Army civilian workforce. This model is useful not only for fostering a better understanding of the relationship between different elements of civilian readiness but also can serve as a framework to help evaluate metrics for tracking readiness. At the end point of the model (on the right) are the desired readiness outcomes that tie into individual, organizational, functional, and Army operational and strategic readiness. Metrics intended to measure readiness should ideally focus on these readiness outcomes or the outputs that feed into them. The policies, resources, and activities upstream are best considered as levers that impact readiness. Over time, the process reflected in this logic model is repeated with outcome measures and modified mission requirements influencing future decisions about the inputs, resources, and activities needed to support readiness.

Metrics for Assessing Civilian Workforce Readiness

We leveraged the logic model when considering how the Army should measure civilian workforce readiness, with an eye toward the preference for metrics associated with elements further to the right in the logic model. Metrics related to *outputs*, such as fill rate, compare observed characteristics with a target or requirement. Such metrics are well suited to measuring readiness. Metrics related to *activities*, such as average time to hire, shed light on exist-

FIGURE S.1
Logic Model of Army Civilian Workforce Readiness



ing processes that shape the workforce and influence its readiness but do not directly convey information about readiness.

We compiled a list of potential metrics comprised of 34 metrics proposed as part of the Army's Civilian Implementation Plan (CIP) and six additional metrics proposed independently by our team based on our collective experience and expertise in the area of readiness. Each of the metrics was assessed using three criteria:

- *validity*, or the extent to which the metric captures readiness itself
- *reliability*, or the extent to which the metric is computed with data that are objective and are collected using an established process
- *feasibility*, or the ease with which the requisite data can be collected.

We reduced the list of metrics to those most closely associated with readiness assessment. *Valid* readiness metrics compare observed workforce characteristics with a target or requirement. Table S.1 summarizes the high-validity metrics that we recommend the Army focus on when applying and implementing civilian workforce readiness metrics.

The collection of metrics includes metrics for *fill* (whether a position is filled), *fit* (employee knowledge, skills, and abilities [KSA]), equipment, and *continuity* (institutional memory and experience) at both the individual and the organizational or functional levels. We recommend that the Army strive to track all four aspects of readiness (fill, fit, equipment, and continuity) at both levels. The metrics are described in general terms; tailoring the metrics for application to specific functions or organizations requires a collaborative effort between functional and organizational leads and more-robust data. Some of the metrics, such as fill rate, are more specific and, at least in theory, can be computed for key segments of the Army civilian workforce.

The Need for Data to Support Readiness Assessments

Our research revealed a lack of systematic, usable data about civilian workforce needs (often referred to as *requirements*), and this is the primary barrier to the development of robust, usable civilian workforce readiness metrics. Readiness assessment efforts that leverage existing data are limited by these data gaps. Assessing readiness involves comparing requirements for a position (demand) with characteristics of the person filling the position (supply). To support such a comparison, workforce requirements data must be linked to workforce supply (personnel) data. Personnel data that can be used to describe the size, shape, and attributes of the current workforce are relatively plentiful and well understood, although some gaps persist (e.g., certifications, soft skills, and equipment). Data that capture requirements are both less plentiful and less reliable. Moreover, requirements data cannot be matched easily with personnel data to compute readiness metrics, such as fill rate, and position descriptions are often incomplete or out of date.

TABLE S.1
Metrics That Relate Directly to Readiness Outputs

Output	Aspect	Candidate Metrics	
		Individual Level	Organizational or Functional Level
Civilian workforce sufficiently staffed	• Fill	• N/A	<ul style="list-style-type: none"> • Fill rate • Fill rate for critical positions (e.g., MCO, STEM)
Civilians meet job requirements	• Fit	<ul style="list-style-type: none"> • Employee possesses the education level required by position • Employee possesses the proper certifications or licenses, or both • Employee possesses the technical skills required by position • Employee meets the physical requirements for position • Employee meets the other job requirements (e.g., vaccinations, passport, clearance) 	<ul style="list-style-type: none"> • Percentage of employees with the required education level • Percentage of employees with the required certifications or licenses, or both • Percentage of employees with the required technical skills • Percentage of employees meeting the physical requirements • Percentage of employees meeting the other job requirements (e.g., vaccinations, passport, clearance)
Civilians sufficiently trained	• Fit	• Employee is current on the required training	• Percentage of employees current on the required training
Civilians fully and appropriately equipped	• Equipment	• Employee has the proper equipment	• Percentage of employees with the proper equipment
Institutional memory and experience preserved	• Continuity	<ul style="list-style-type: none"> • Number of years in the position • Number of years in the organization • Number of years in the Army • Retirement eligibility 	<ul style="list-style-type: none"> • Average number of years in the position • Average number of years in the organization • Average number of years in the Army • Percentage of workforce eligible for retirement • Attrition and accession rates consistent with workforce targets

NOTE: MCO = mission critical occupation; N/A = not applicable; STEM = science, technology, engineering, and mathematics.

Our interviews with functional and organizational managers and our data review found that the Army lacks a common go-to source of information about civilian workforce requirements that speaks to the critical requirements associated with funded civilian positions. A single authoritative source of information on workforce needs (one that is associated with positions and personnel, as well as mechanisms to gather that information by function or career field and by organization) would provide insight into whether the Army has the right

number of people with the right skill sets and competencies in the right jobs, as our definition of civilian workforce readiness calls for. Both organizational and functional leaders could look to a single source for data and information, which is likely to promote buy-in for reporting and updating data.

Building a data source to support the development of readiness metrics would require coordinated effort across the Army, but the Army is not starting from ground zero. The Federal Employee Viewpoint Survey (FEVS) provides data obtained directly from employees about the work environment, work supports, and work-related satisfaction that could be leveraged to look at dimensions of organizational readiness. The Defense Acquisition Workforce Improvement Act (DAWIA), which applies to the acquisition workforce only, mandates the collection of position-level data that include career field and certification requirements and can be matched with personnel data. Such pilot efforts in the Army as the Ready Army Civilian Tool (RAC) and Career Mapping Tool (CMT) are worth tracking for lessons learned. The former collects information about tangible hard skills (such as the ability to travel) and intangible soft skills (such as conflict resolution from both the employer and their manager). The latter integrates information from multiple sources, including personnel data systems, skills assessments, and behavioral assessments, implemented through games to produce information dashboards. Although the data collection can be labor-intensive, the Army should monitor these initiatives—and possibly extend their more promising features to the larger civilian workforce—to support the development and computation of readiness metrics.

Recommendations

To ground workforce planning solidly in a concept of workforce readiness, the Army needs to specify a consensus-based definition of civilian readiness to apply across the Army and develop new data resources that allow managers at different levels of the Army to assess the gaps between workforce requirements and workforce supply. Toward these aims, we offer the following recommendations.

The Army Needs a Definition of Civilian Readiness

At the time of writing, the understanding of what civilian readiness means is not consistent across the Army: A consensus-based definition is needed to fill this gap. The definition of civilian readiness developed by RAND Corporation researchers could serve as a starting point for the Army to specify a formal, codified definition of civilian readiness for use Army-wide. We recommend that the Army (and perhaps DoD as a whole) build consensus on a definition of civilian readiness through formal processes that could create buy-in across the Army. Such consensus and buy-in is critical to developing metrics of civilian readiness (see later recommendation on the need for the Army to improve civilian readiness data resources).

Implementation of this recommendation would involve updating or creating a new Army regulation similar to the one used for Army unit status reporting. In this reporting, key ter-

minology is defined along with its context within the bigger strategic-readiness picture, an authoritative system of record is designated, roles and responsibilities with respect to reporting and monitoring reports are established, and other business rules are defined. In several of these steps, an existing office or system might take on a new responsibility or an entirely new entity might be required.

The Army Needs to Refine Its Processes for Specifying Current and Future Civilian Workforce Needs

Organizational representatives (e.g., commanders) and career field managers (functional leads) have roles to play in ensuring that the specification of current workforce needs is accurate, up to date, and makes sense from an individual, organizational, and functional perspective. Collaboration between organizational and career field managers to specify and document key workforce requirements associated with current positions would help meld short- and long-term perspectives and contribute to more-effective strategic workforce planning. The oversight structure for the defense acquisition workforce (as specified in Department of Defense Instruction 5000.66) could serve as a model for an Army-wide framework for civilian workforce oversight and data collection.

The Army Needs to Improve Civilian Readiness Data Resources

The Army should establish a single source of information about Army civilian workforce requirements that can be linked to personnel data. A lack of such data is a key barrier to the construction of readiness metrics and the robust use of such metrics in civilian workforce planning.

Readiness metrics must be grounded in position requirements and capture the gap between those position requirements and workforce supply. Constructing usable measures requires data, systems, and tools for analyzing the data; it also involves choices about the level at which to assess these gaps and what to prioritize.

A key action item is to identify a short list of data to be reported regularly to reflect workforce requirements. We advise the Army not to let the perfect be the enemy of the good. Start small, with essential requirements that would be easy to report and useful for both organizational and functional managers. This review should be guided by a recognition that the quality of data reported is tied to accessibility and opportunities to use the data.

Conclusion

Strategic workforce planning efforts support workforce readiness by tracking anticipated workforce needs, comparing those needs to workforce supply, identifying gaps, and developing approaches for addressing those gaps. Operational workforce planning manages actual workforce readiness by tracking those ever-changing needs as influenced by unanticipated shifts to supply, demand, or both. To better ground both strategic and operational workforce

planning efforts in readiness metrics, the Army needs to foster consensus and collaboration between functional and operational leads by promulgating a definition of civilian workforce readiness and supporting the systematic collection of data about the workforce requirements that matter. In this report, we direct the Army's attention to general metrics that do speak to readiness. Data templates and reporting frameworks that are general at the enterprise level and become increasingly specific at the functional and position levels would help guide the effort to develop readiness metrics. Specific aspects of readiness metrics to prioritize will vary by functional area and position and will change over time.

Contents

About This Report	iii
Summary	v
Figures and Tables	xv
CHAPTER 1	
Introduction	1
Approach, Scope, and Limitations.....	3
Roadmap of the Report	5
CHAPTER 2	
Defining Army Civilian Workforce Readiness	7
Codified Army Definitions of Readiness	7
Proposed Readiness Definition for the Army Civilian Workforce.....	8
Temporal and Adaptability Considerations Related to Civilian Readiness	11
Summary.....	13
CHAPTER 3	
Army Civilian Workforce Readiness Framework	15
The Logic Model	15
Perspectives on Enablers and Barriers to Civilian Workforce Readiness	20
Summary.....	22
CHAPTER 4	
Metrics for Assessing Civilian Workforce Readiness	23
Connecting Readiness Metrics to Our Readiness Framework.....	23
Identifying Civilian Readiness Metrics.....	25
Evaluating the Candidate Metrics	28
Aligning More-Promising Metrics with the Logic Model.....	31
Summary.....	35
CHAPTER 5	
Data to Support Readiness Assessments	37
Existing Data Sources	37
Initiatives to Further Develop Civilian Readiness Data and Metrics.....	42
Summary.....	49
CHAPTER 6	
Conclusions and Recommendations	51
The Army Needs a Definition of Civilian Readiness	51

The Army Needs to Refine Its Processes for Specifying Current and Future Civilian Workforce Needs.....	52
The Army Needs to Improve Civilian Readiness Data Resources.....	53
Conclusion	55
APPENDIXES	
A. Methodology	57
B. Key Insights from the Literature Review.....	67
C. Interview Protocol	75
D. Federal Employee Viewpoint Survey	81
E. Metrics for Evaluating Candidates	87
Abbreviations.....	91
References	93

Figures and Tables

Figures

S.1.	Logic Model of Army Civilian Workforce Readiness.....	vi
2.1.	Readiness Definition Agreement by Occupational Series.....	9
2.2.	Nested Civilian Readiness Levels.....	12
3.1.	Logic Model of Army Civilian Workforce Readiness.....	17
4.1.	Relationship Between the Logic Model and Readiness Metrics.....	24
5.1.	Fiscal Year 2021 Certification Status of Acquisition Workforce Personnel, by Career Field	43
5.2.	Career-Level Attainment for Fiscal Year 2014 New Civilian Entrants to the Acquisition Workforce, by Career Field	44
A.1.	Logic Model Relationships	61

Tables

S.1.	Metrics That Relate Directly to Readiness Outputs.....	viii
2.1.	Army Operational Readiness and Workforce Planning Definitional Similarities.....	10
4.1.	Objectives of Readiness Metrics.....	25
4.2.	Collective Set of Candidate Metrics.....	27
4.3.	Proposed Modifications to Certain Candidate Metrics.....	29
4.4.	Assessment Criteria for Candidate Metrics.....	29
4.5.	Example Candidate Metrics Assessment.....	30
4.6.	Metrics That Relate Directly to Readiness Outputs.....	32
4.7.	Metrics That Relate to Activities That Support Readiness.....	33
5.1.	Tracking Status of Supply-Side Data Needed to Construct Civilian Workforce Characteristics.....	39
5.2.	Tracking Status of Demand-Side Data Needed to Construct Civilian Workforce Requirements.....	40
5.3.	Example Mapping of Federal Employee Viewpoint Survey Data to Logic Model Components.....	41
A.1.	Search Terms for Scholarly and Peer-Reviewed Articles.....	58
A.2.	Breakdown by Organization of the Interviews Conducted.....	59
A.3.	Assessment Underpinning the Selection of the Six Occupational Series	64
D.1.	Proposed Federal Employee Viewpoint Survey Items to Monitor Army Civilian Readiness.....	84
E.1.	Metrics for Evaluating Candidates.....	88

Introduction

The civilian workforce plays a central and unique role in helping the U.S. Army achieve its mission within a total force perspective. Approximately 300,000 civilians represent nearly one-quarter of the Army’s organic workforce.¹ Army civilians provide leadership and expertise alongside military personnel whom they support by fulfilling critical functions across approximately 500 occupations.² Unlike contractors, civilians can execute inherently governmental functions.

Because civilians rotate less frequently than military members and contractors, they represent the institutional memory for many Army offices or agencies where they work. Civilians bring stability, continuity,³ and diverse perspectives and experiences to the agency while allowing uniformed personnel to focus on warfighting.⁴ Civilians can offer more expertise and value than military personnel. Within a reasonable range of assumptions about the substitution rate of military personnel to civilian staff, the costs to the federal government and the U.S. Department of Defense (DoD) tend to be lower when staffing roles or positions that do not require military-specific skills use the civilian staffing model.⁵

There is growing recognition that the civilian workforce contributes to strategic readiness.⁶ For example, they contribute to manning (one of the Army Strategic Readiness tenets⁷)

¹ U.S. Army, *Army People Strategy—Civilian Implementation Plan*, 2022, p. 4.

² U.S. Army, 2022, p. 4.

³ Jennifer Lamping Lewis, Edward G. Keating, Leslie Adrienne Payne, Brian J. Gordon, Julia Pollak, Andrew Madler, H. G. Massey, and Gillian S. Oak, *U.S. Department of Defense Experiences with Substituting Government Employees for Military Personnel*, RAND Corporation, RR-1282-OSD, 2016, p. 57.

⁴ U.S. Army, 2022, p. 5.

⁵ Lewis et al., 2016, p. 57; U.S. Army, 2022, p. 4; Congressional Budget Office, *Replacing Military Personnel in Support Positions with Civilian Employees*, December 7, 2015.

⁶ There are ongoing Army efforts to revisit Strategic Readiness Tenets, as well as DoD efforts to revise the Strategic Readiness Assessment process. There is a Human Capital and Business process, an organization readiness dimension for the Strategic Readiness Assessment, and a Manning tenet in the Army Strategic Readiness Tenets.

⁷ Army Regulation 525-30, *Military Operations: Army Strategic and Operational Readiness*, Headquarters, Department of the Army, April 9, 2020.

and through direct support to warfighting capabilities.⁸ Civilians contribute to aspects of Army mission(s), and the readiness of the mission affects strategic decisionmaking. Whereas the concept of readiness in the military—from tactical to operational to strategic—is well studied and relatively well understood, consensus on a definition of civilian readiness is lacking. As a result, a systematic way of measuring and reporting civilian readiness has yet to be developed. Following the Seeing, Managing, Reporting construct,⁹ the ability to measure civilian readiness in a systematic manner would allow the Army to

- *see*, or to be aware of, the civilian workforce’s current capabilities, informing decisions about availability and resource allocation
- *manage* readiness investments in areas that currently need improvement to meet the demands of the strategic environment while finding a balance with investments needed to improve readiness in the long term
- *report* to DoD and Congress on the readiness of the civilian workforce to increase high-level awareness and inform decisionmaking.

Both the Army People Strategy (APS) and the Civilian Implementation Plan (CIP) seek to improve strategic workforce planning by focusing the attention of managers on the readiness of the civilian workforce. Strategic workforce planning has been a focus of federal and DoD effort since at least 2001, when the previously named U.S. General Accounting Office (now known as the U.S. Government Accountability Office or GAO) identified Strategic Human Capital Management as a high-risk area government-wide.¹⁰ In the past 20 years, there have been numerous initiatives to improve strategic workforce planning in DoD, including the short-lived implementation of a DoD-specific personnel management system (the National Security Personnel System).¹¹

⁸ G. James Herrera, *The Fundamentals of Military Readiness*, Congressional Research Service, R46559, October 2, 2020.

⁹ Brian Dolan, Bonnie L. Triezenberg, Emmi Yonekura, Sandra Kay Evans, Moon Kim, Dwayne M. Butler, Sarah W. Denton, and Shreyas Bharadwaj, *Understanding, Managing, and Reporting U.S. Space Force Readiness*, RAND Corporation, RR-A977-1, 2023.

¹⁰ For federal efforts, see General Accounting Office, *A Model of Strategic Human Capital Management: Exposure Draft*, GAO-02-373SP, 2002; for DoD efforts, see David M. Walker, *Human Capital: DOD’s Civilian Personnel Strategic Management and the Proposed National Security Personnel System*, testimony before the Subcommittee on Oversight of Government Management, the Federal Workforce and the District of Columbia, Senate Committee on Governmental Affairs, U.S. General Accounting Office, GAO-03-493T, 2003.

¹¹ Brenda S. Farrell, *Performance Management: DOD Is Terminating the National Security Personnel System, but Needs a Strategic Plan to Guide Its Design of a New System*, U.S. Government Accountability Office, GAO-11-524R, 2011.

The issue has remained on the GAO’s High Risk List, partly because of talent management shortfalls that have resulted in skill gaps.¹² The APS seeks to “maximize the engagement and contribution to readiness of Soldiers and Civilians by aligning their unique talents against organizational talent demands.”¹³ In support of this aim, the CIP of the APS calls for the Army to enhance its strategic workforce planning through the use of readiness measures (Objective E1 and especially Task E-1.3). The CIP also focuses on the need to develop the capacity to link information about mission requirements to people (Objective E2). A cross-cutting objective added to the 2022 version of the CIP calls on the Assistant Secretary of the Army for Manpower and Reserve Affairs to develop and implement a talent management technology and data strategy that can support the objectives in the CIP.¹⁴ These recommendations align with concerns that had previously surfaced and recommendations made in May 2022 by the Defense Business Board (DBB).¹⁵

The Army asked RAND Arroyo Center to support the CIP’s objectives by developing a method for measuring the readiness of its civilian workforce. This method would be grounded in a definition of Army civilian readiness that could inform policies and practices related to sizing and management of the Army civilian workforce, along with metrics for assessing Army civilian readiness.

Approach, Scope, and Limitations

To address the U.S. Army’s request to develop a method for measuring the readiness of the Army’s civilian workforce, our team focused on three core questions that underpin our research:

1. What definition of civilian readiness will reflect its purpose, function, and contributions to operational and strategic readiness in the Army?
2. What metrics should be used now and in the future to assess Army civilian workforce readiness?
3. What authorities and policy changes would be needed to implement these metrics?

¹² See GAO, “High Risk List,” webpage, undated; and GAO, *High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas*, GAO-21-119SP, 2021.

¹³ U.S. Army, 2022, p. 7.

¹⁴ U.S. Army, 2022, pp. 42–45.

¹⁵ DBB, *Strengthening Defense Department Civilian Talent Management*, Department of Defense, DBB FY22-03, May 18, 2022.

To answer the research questions, we integrated information derived from a multi-method approach that relied on the following lines of effort:

- We reviewed the existing literature and policy documents related to workforce readiness for industry, other private sector entities, and U.S. government organizations, including the U.S. Army and other DoD agencies.
- Between February and April 2022, we conducted 23 interviews with 32 stakeholders across various Army and DoD offices and organizations and systematically analyzed the information collected.
- We developed a logic model to depict both readiness outcomes and readiness processes in terms of policy, inputs and resources, activities, and outputs. The logic model was validated through expert feedback and connectivity analysis.
- We reviewed various U.S. government databases to identify potential sources of data that could inform the design of civilian workforce metrics.¹⁶ We also reviewed and evaluated metrics that are in use or have been proposed by the CIP.

We summarize our methodological approach here and refer readers to Appendix A for more detail.

To ground our study and surface practical recommendations, we focused our data gathering on six occupational series, as defined by the U.S. Office of Personnel Management (OPM):

- 0201—Human Resources Management
- 0346—Logistics Management
- 0610—Nursing
- 1102—Contracting
- 2210—Information Technology (IT) Management
- 5801—General Transportation/Mobile Equipment Maintenance.

Occupational series were used as a structuring principle, not because we believed that such series should be the focus of workforce planning efforts but because occupational series cut across organizations within the Army and are mapped to career fields. By focusing on these occupational series, we were able to consider issues and opportunities related to a range of functions and capture employees who are subject to special oversight mechanisms (e.g., cyber, acquisition, expeditionary, Title 32 [dual status]). These occupational series account for almost 20 percent of Army appropriated fund (APF) employees when combined.¹⁷

¹⁶ The databases included the Defense Manpower Data Center (DMDC) civilian personnel files, the Army's Force Management System (FMSWeb), the federal government's Fully Automated System for Classification (FASCLASS), and the Federal Employee Viewpoint Survey (FEVS).

¹⁷ We did not include the most common occupational series (301—Miscellaneous Administration and Program). This series accounts for over 20,000 civilian personnel and nearly 8 percent of the Army civilian workforce. The 2022 DBB report on civilian talent management calls out the prevalence of the 301 occupa-

The Army civilian workforce is part of a larger DoD-wide civilian workforce and federal workforce, and any efforts made by the Army to define its readiness will be influenced by related DoD and federal policies, procedures, and initiatives. That is not to suggest that the Army should wait for DoD or the federal government to act on important talent management issues. The Army employs about one-third of the civilian workers in DoD, which is itself the largest employer of civilian workers in the federal government.¹⁸ Proactive efforts on the part of the Army could shape DoD- and federal government-wide efforts.

One of the limitations associated with our research is that our team requested but was not able to obtain access to Army Civilian Personnel System (ACPERS) data for this study. Second, a key data source with information on personnel authorizations—FMSWeb was offline for several months.

Roadmap of the Report

Chapter 2 draws on concepts of military strategic and operational readiness and definitions of readiness used in the private sector to develop a definition of Army civilian readiness. Chapter 3 presents a conceptual framework for understanding the factors that contribute to Army civilian workforce readiness. Chapter 4 applies that conceptual framework to describe how the Army can measure workforce readiness and the processes that support it. We describe some metrics that the Army can use to determine whether readiness outcomes have been achieved or are on track and describe options for improving readiness measurement. Having access to appropriate and systematically gathered data is essential for using metrics to measure readiness, which we discuss in Chapter 5, along with relevant initiatives that could help fill gaps in current Army resources. In Chapter 6, we present key conclusions and recommendations for the Army. The report also contains six appendixes, which provide further detail on our methodology and the results of our review of the literature and evaluation of candidate metrics. Appendix A provides a detailed methodological overview. Appendix B summarize findings from our literature review. Appendix C provides the interview protocol used in this study. Appendix D provides information on the FEVS as a readiness data source. Appendix E provides more information on our approach to the evaluation of candidate readiness metrics and results of that evaluation.

tional series (created as a catchall category to capture administrative positions that could not be classified into other occupations) in DoD as evidence that the occupation-based classification system is broken (DBB, 2022, p. 27).

¹⁸ Kathryn A. Francis and Ramona J. Diaz, “Defense Primer: DOD Appropriated Fund Civilians,” Congressional Research Service, IF 11131, March 12, 2019.

Defining Army Civilian Workforce Readiness

Across government and the private sector, workforce readiness is a key input for an organization's operational success. In this chapter, we propose a definition of Army civilian readiness by integrating insights from prior literature and interviews we conducted. We first present an overview of the way readiness is approached for military personnel. Next, we articulate our proposed definition of civilian readiness. We describe how this definition relates to the existing literature on workforce planning in the private sector; its application at individual, organizational, and functional levels; and discuss how it can be adapted to shed light on readiness of the current and future Army civilian workforce.

Codified Army Definitions of Readiness

On the military side, the Army has codified its definitions of operational and strategic readiness in Army Regulation 525-30, *Military Operations: Army Strategic and Operational Readiness*. These definitions are as follows:

Army Operational Readiness. Operational readiness is the Army's ability to provide and support Combatant Commanders (CCDRs) operational plans (OPLANs) with trained and ready forces in the quantity and with the capabilities required to achieve Global Force Management Allocation Plan (GFMAP) and other operational requirements for Army forces.

Army Strategic Readiness. Strategic Readiness is the Army's ability to provide adequate forces to meet the demands of the NMS [National Military Strategy].¹

As required for any Army Regulation, the codification of this definition was coordinated with Army senior leadership and ultimately approved by the Secretary of the Army. On top of being codified, the military side of the Army must regularly comply with the required monthly tactical (unit) readiness reporting and the quarterly Army Strategic Readiness

¹ Army Regulation 525-30, 2020, p. 2.

Assessment process.² For tactical unit readiness reporting, each unit commander is responsible for assessing the unit's resources (i.e., personnel, equipment supply, equipment condition, and training) and capabilities as defined by its mission essential task list. The Army Strategic Readiness Assessment takes inputs regarding manning, equipping, sustaining, training, leading, and installations from Army Commands, Army Service Component Command, Direct Reporting Units, Army National Guard, U.S. Army Reserve, Army Staff, and the Commander's Unit status report. It is through codification and regular engagement that the understanding of what it means to be ready on the military side of the Army has been ingrained in the culture.

Another piece of military readiness that goes alongside operational readiness is that of institutional readiness, which is the readiness of administrative or generating forces with missions (e.g., recruitment, training, and equipping) that support operational readiness and are considered "essential to producing and sustaining military readiness."³ We note that operational readiness depends primarily on military forces and, to some degree, on civilian employees, while institutional readiness depends on civilian employees to a larger degree. However, institutional readiness is not mentioned in the Army Regulation on strategic and operational readiness.

There is not a codified definition and broadly accepted understanding of what civilian readiness means in the Army. Some of our interviewees indicated that a definition or understanding of civilian readiness was not set in stone for the Army, while others made suggestions for what the definition should be from their perspective.⁴

Proposed Readiness Definition for the Army Civilian Workforce

To develop a definition of readiness for the Army's civilian workforce, we used the Army's definition of strategic readiness for military personnel as a starting point, then expanded it using insights we garnered from reviewing the literature on workforce planning for private sector organizations. While the *readiness of military personnel* is defined as "the ability to provide adequate forces to meet the demands of the National Military Strategy,"⁵ we define *readiness for the civilian workforce* as:

² For unit reporting, see Army Regulation 220-1, *Field Organization: Army Unit Status Reporting and Force Registration—Consolidated Policies*, Headquarters, Department of the Army, April 15, 2010.

³ Herrera, 2020, p. 15.

⁴ Throughout this report, we present quoted text and other interview-derived findings from the more than 70 interviews that we conducted with stakeholders across the Army and DoD. Interviews were conducted without attribution in order to protect interviewees' anonymity.

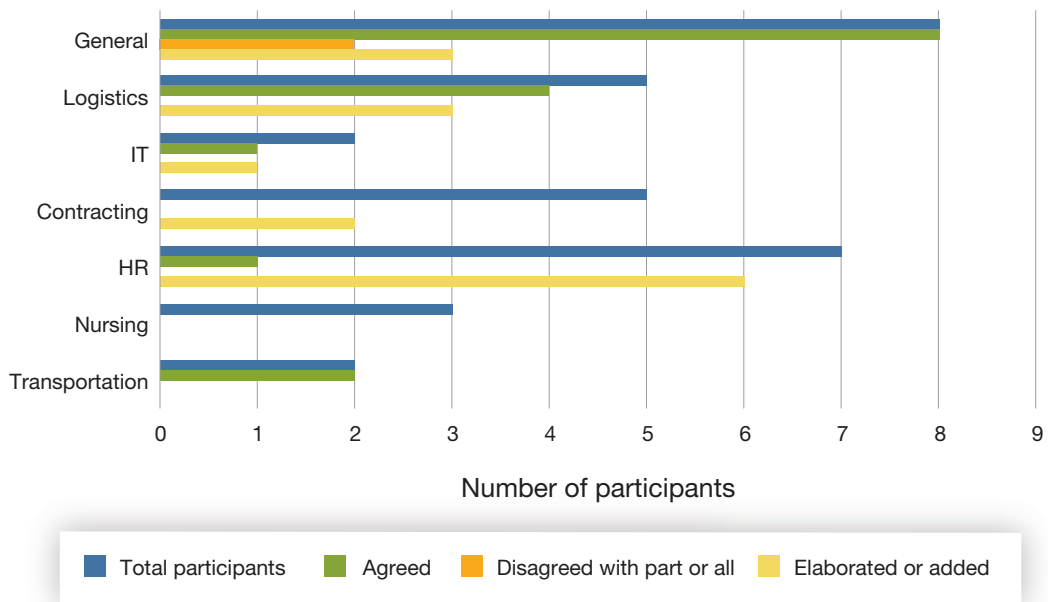
⁵ Army Regulation 525-30, 2020, p. 2.

The capability of civilians to support Army missions as well as the state of having the right number of people with the right set of skills, competencies, resources, and experiences in the right job at the right time.

This definition aligns with assessments of military operational readiness and workforce planning approaches, both of which are important considerations for the Army civilian workforce. We presented a version of this definition in each of our interviews and received feedback on whether the interviewees agreed or disagreed with part or all of the definition, and whether they would like to elaborate or add to the definition. Responses from interviewees across the six occupational series and other interviewees (i.e., “general”) are shown in Figure 2.1. Where interviewees had a response, there was predominantly agreement with the definition (shown in green) along with some suggestions for elaborations or additions on the definition (shown in yellow). Examples of these elaborations include aspects of job fit, adaptability, and certifications. The instances of disagreement were due to the ongoing effort to define readiness of the interviewee’s organization.

In Table 2.1, we show the parallels between elements of the Army definition of operational readiness and the workforce planning perspective. We carried out a cross-sector review to

FIGURE 2.1
Readiness Definition Agreement by Occupational Series



NOTE: HR = human resources. This figure summarizes the responses from interviewees about whether they agreed with RAND’s proposed definition of civilian readiness and whether they elaborated on the definition. In some cases, participant answers resulted in categorization for multiple agreement categories. We do not show counts for when there was no response from a participant, as was the case for participants in the Nursing occupational series. The breakdown of the answers is by the six occupational series and other interviews (i.e., “general” category).

TABLE 2.1
Army Operational Readiness and Workforce Planning Definitional Similarities

Army Operational Readiness	Workforce Planning Perspective on Readiness
Quantity required	Right number
Trained forces	Right skills; right competencies
Capabilities required	Right job
Ready forces	Right time

understand how workforce readiness relates to organizational strategic readiness; we then distilled commonalities across sectors to arrive at a conceptual approach that can be used for the readiness of the Army’s civilian workforce.

The workforce planning perspective on readiness encompasses individual and organizational aspects of readiness. *Individual readiness* emphasizes motivation or resolve,⁶ as well as readiness to enter the workforce, which encompasses the extent to which the individual has the “attitudes, skills, and knowledge that can help them prepare for success at work.”⁷ Individual readiness is associated with both hard and soft skills, a range of abilities (technical, methodological, social, and personal), and flexibility. This combination of knowledge, skills and attitudes is what allows individuals to “work independently . . . [and] adjust to the cultural demands at work.”⁸ Many of our interviewees mentioned the relationship among knowledge, skills, and readiness. Adaptability and openness to change was raised in several of the interviews we conducted and is discussed in more detail later in this chapter. A few interviewees suggested that the definition of individual readiness may change depending on the environment (e.g., if the individual deploys).

Organizational readiness is conceptualized in different ways in the organizational change literature and the workforce planning literature. The former likens organizational readiness to motivation and capacity to implement or respond to change, including to “respond to and recover from a disruption.”⁹ In contrast, the workforce planning literature defines *organizational readiness* as having the “right number of people with the right set of skills and com-

⁶ James W. Dearing, “Organizational Readiness Tools for Global Health Intervention: A Review,” *Frontiers in Public Health*, Vol. 6, No. 56, March 2, 2018.

⁷ Fatwa Tentama and Eva Riyansha Riskiyana, “The Role of Social Support and Self-Regulation on Work Readiness Among Students in Vocational High School,” *International Journal of Evaluation and Research in Education*, Vol. 9, No. 4, December 2020, p. 827.

⁸ Tentama and Riskiyana, 2020, p. 827.

⁹ Brian Strong, “Creating Meaningful Business Continuity Management Programme Metrics,” *Journal of Business Continuity & Emergency Planning*, Vol. 4, No. 4, November 2010, p. 363; see also Bryan J. Weiner, “A Theory of Organizational Readiness for Change,” *Implementation Science*, Vol. 4, 2009, p. 1.

petencies in the right job at the right time.”¹⁰ When asked, many interviewees related to the workforce planning definition. Appendix B provides additional background on our literature review and description of specific sources and examples.

Because of the way the Army civilian workforce is employed and managed throughout the Army, we broaden the concept of organizational readiness by also including *functional readiness*. Within an organization (e.g., command, program office, or work unit) there may be civilians from a variety of occupations serving a variety of functions. The organizational supervisor specifies workforce requirements (who is the right person) and oversees these individuals. However, Army civilians are also associated with a career field based on the occupational series to which they belong. Career field managers are responsible for talent management of Army civilians enterprise-wide.¹¹ Career field managers support talent acquisition, development, and management, including supervisory talent management for civilians in their area. In view of this management structure, responsibility for key talent management functions can be unclear. For example, when it comes to training and development, organizational managers may identify and fund training and development needs or they may look to career fields to do so. Several interviewees indicated that lines of responsibility pertaining to these talent management functions are not always clear. In cases where the career field is strongly associated with a particular organizational unit (e.g., the medical career field and U.S. Army Medical Command [MEDCOM]), the opportunities for coordination or clarification of roles could be made stronger. The evaluation of readiness for a specific civilian function can still follow that of organizational readiness: the right number of people with the right set of skills and competencies in the right job at the right time with the right supports that provide a capability. For functional readiness, that capability would be defined for the function rather than the individual position. In Figure 2.2, we illustrate the nested relationship of each level of readiness—individual, organizational and functional, and Army-wide—along with its tailored definition.

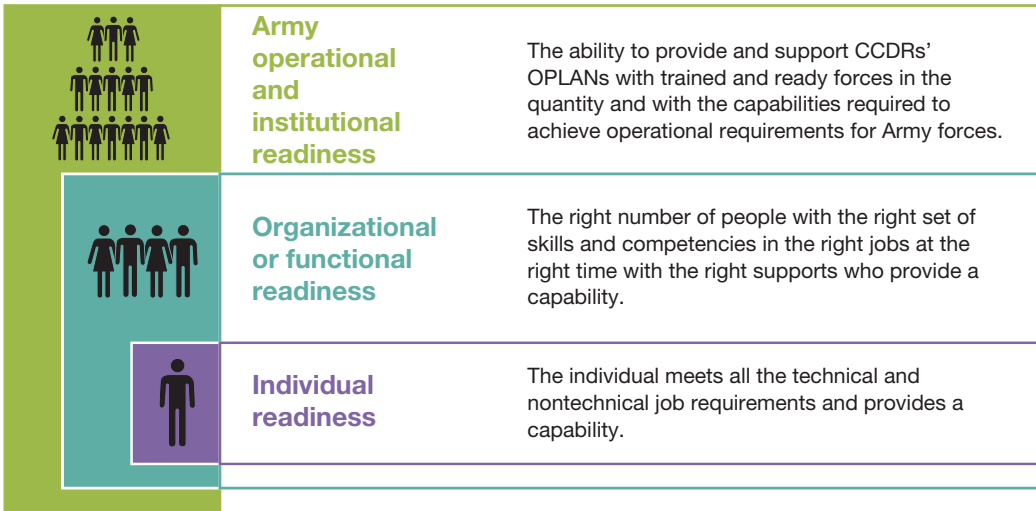
Temporal and Adaptability Considerations Related to Civilian Readiness

The workforce planning literature makes a distinction between strategic and operational workforce planning. *Strategic workforce planning* supports workforce readiness by tracking anticipated workforce needs, comparing those needs with workforce supply, identifying gaps, and developing approaches for addressing those gaps. *Operational workforce planning*

¹⁰ Susan M. Gates, Christine Eibner, and Edward G. Keating, *Civilian Workforce Planning in the Department of Defense: Different Levels, Different Roles*, RAND Corporation, MG-449-OSD, 2006, p. 85.

¹¹ In 2020, the Army restructured the functional oversight of the Army civilian workforce by consolidating 32 career programs into 11 career fields. See Kari Hawkins, “Army Looks to Career Program Managers to Ensure Capable Civilian Workforce,” U.S. Army, February 19, 2021a.

FIGURE 2.2
Nested Civilian Readiness Levels



SOURCE: Derived from Army Regulation 525-30, 2020.

supports actual workforce readiness by tracking ever-changing needs that are influenced by unanticipated shifts to supply, demand, or both.¹² U.S. government interviewees emphasized that civilian readiness can be considered from a current and a future-oriented perspective. They emphasized the following three factors influencing the Army civilian workforce's ability to meet current and future demands:

- *The Army's needs:* Interviewees expressed that readiness definitions are grounded first and foremost in a clear understanding of what the current workforce requirements are and an expectation that the individuals who are part of the civilian workforce today fill those requirements. These requirements are potentially reflected in a variety of sources, such as manning documents and position descriptions (PDs).
- *Workforce adaptability:* As the Army's needs are evolving, there is the question of whether the current workforce can adapt to these constantly evolving needs. The importance of the civilian workforce's adaptability in the face of changes in the work environment—such as telework, upcoming day-to-day situations in an increasingly complex workplace, and advancements in IT management and communications—came up in several interviews we conducted for this project. Some interviewees explicitly linked the individual worker's ability to adapt to changes in the work environment to the readiness of the

¹² Dan L. Ward, Rob Tripp, and Bill Maki, *Positioned: Strategic Workforce Planning That Gets the Right Person in the Right Job*, AMACOM, 2013, p. 30.

civilian workforce. Overall, the adaptability of the workforce to day-to-day and long-term changes represents an enduring feature of workforce readiness.

- *The Army's ability to fill vacant positions:* In addition to understanding current and evolving needs of the Army, interviewees emphasized that readiness entails meeting those needs by hiring the right number of people with the right skills and competencies to do their jobs well.

To achieve readiness of the civilian workforce, the Army not only needs to identify its current needs and consider whether its current workforce is capable to adapt to continuously evolving requirements, it also needs to consider what its future needs will be and how it can develop a workforce pipeline that will respond to these future needs. Furthermore, to ensure the civilian workforce's readiness, it is important for the Army to assess its ability to fill new and vacant positions today and in the future.

The current workforce's ability to meet requirements is usually addressed at the individual and organizational levels. Supervisors and hiring managers are usually the ones who judge whether (1) the civilian workforce's training and competencies are up-to-date and sufficient to meet day-to-day operational needs, (2) the equipment they need to perform their jobs is available, and (3) the individuals who are being hired have both the hard and soft skills—including adaptability and critical and independent thinking—needed to ensure the current readiness of the workforce.

The Army's ability to meet future requirements over the longer term is usually addressed at the functional level through strategic workforce planning efforts. Career field managers are usually the ones who ensure that the future workforce will have the hard and soft skills needed to support the Army's mission within a specific occupational series. Strategic workforce planning also considers whether the required occupational mix is likely to change. At the functional level, career field managers also identify individuals who have prospects to become senior leaders and ensure that they receive the opportunities necessary to grow professionally and develop leadership skills.

Summary

The Army lacks a clear definition of civilian workforce readiness. Total workforce management efforts would benefit from a codified and widely communicated readiness definition to provide a reliable basis for assessing and reporting readiness across the large civilian workforce. We proposed a definition that aligns with both the military understanding and the workforce planning literature and that applies to individual Army civilians, organizations, and functional areas while contributing to Army operational, institutional, and strategic readiness. Our proposed definition of civilian workforce readiness can be applied to the current or future workforce. Applying the definition to the future workforce underscores the importance of adaptability to workforce readiness.

Army Civilian Workforce Readiness Framework

In this chapter, we expand on the Army civilian workforce readiness definition that we presented in the previous chapter and introduce a logic model. We use the logic model as a framework for thinking about both readiness definitions and the processes and structures that support and facilitate the tracking of readiness.

The Logic Model

For the purposes of this study, a logic model is a graphical depiction that shows the relationship between policy, inputs and resources, activities, outputs, and outcomes that are related to the readiness of the Army civilian workforce.¹ Logic models can serve different purposes and comprise different elements. Typically, causal relationships between elements are modeled from left to right (e.g., if certain activities are performed, then one expects to observe certain outputs).²

To develop the initial logic model, we used concepts from the literature review, interviews, and data assessment to formulate the appropriate categories of elements and the elements in each category that would lead to outcomes described by the civilian readiness definition from Chapter 2. The logic model was revised after receiving sponsor feedback, and we also checked for language consistency and connectivity (i.e., all elements had at least one related element upstream and downstream).

We use the logic model as a tool to account for and better understand the relationship between different elements of civilian readiness as well as a framework to help evaluate metrics for tracking readiness (see Chapter 4). We start with the desired readiness outcomes, which tie into the levels of readiness discussed in the previous chapter (i.e., individual, organizational, functional, and Army-operational and strategic), and work backward to identify

¹ For an example definition of a logic model, see Centers for Disease Control and Prevention, “Logic Models,” webpage, December 18, 2018.

² Innovation Network, *Logic Model Workbook*, undated.

what it takes to achieve those outcomes from a management perspective.³ In this logic model, we include

- *policy* (“What is the context?”), defined as external guidance or regulation that set the background assumptions and context for the process
- *inputs and resources* (“What is needed?”), defined as elements to make a process function (e.g., funding, space)
- *activities* (“What does one do?”), defined as actions of the process implementation
- *outputs* (“What happens immediately?”), defined as evidence that activities were performed (e.g., amount or quality of products)
- *outcomes* (“What are the goals?”), defined as changes produced by the process, intended results (e.g., change in skills or knowledge).

The logic model is shown in Figure 3.1 and can be viewed as a process to achieve readiness outcomes. We note that in the context of the Army civilian workforce, this process is repeatable, and measured outcomes could be used by decisionmakers to adjust elements of the process (e.g., inputs or resources and activities) and respond to changes in mission requirements. In the following sections, we will discuss each element in the logic model.

Policy

The main policy element in the logic model is *mission requirements*, which cover any documented demand signal for Army civilians and, in theory, should define the necessary inputs, resources, and potentially activities needed to meet Army mission needs. This is essentially the driver for the civilian workforce demand. Examples of such requirements would be the size and characteristics of the civilian workforce needed to achieve the Army’s mission.

Inputs and Resources

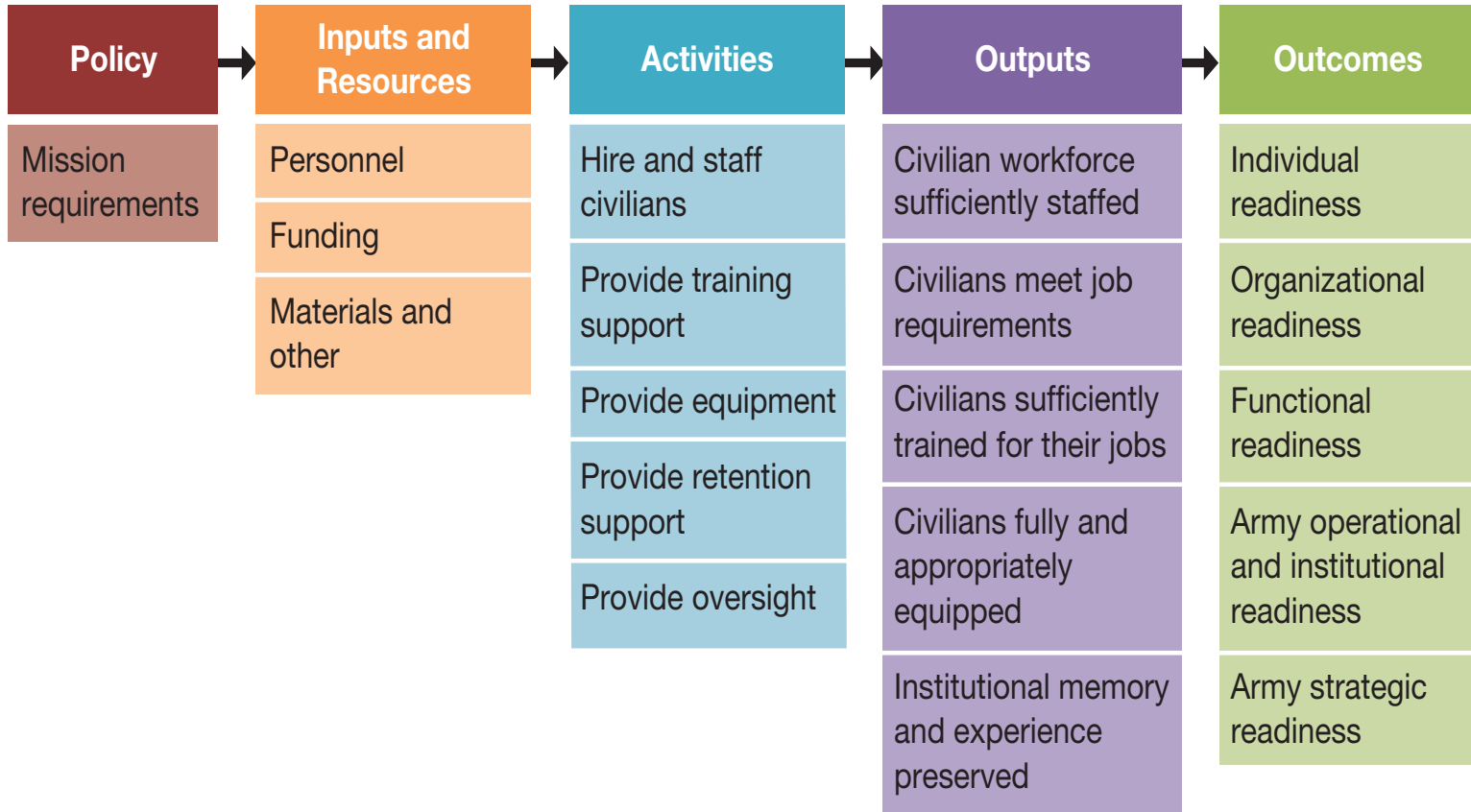
There are three main inputs and resources in the logic model that help support Army civilian workforce activities. The first is *personnel*, which refers to the people who will be filling civilian positions in the Army. *Funding* refers to the money that may be tied to a specific mission requirement (e.g., funding for billets) and would enable the activities downstream. The last input is *resources*, which captures such elements as equipment, training curricula, or facilities needed to conduct a job or training.

Activities

Several broad activities are conducted to get Army civilians into jobs and then provide them with the support they need to do their jobs well (i.e., support from management). The first

³ See Appendix A for more details on the methodology used to create the logic model.

FIGURE 3.1
Logic Model of Army Civilian Workforce Readiness



activity, *hire and staff civilians*, falls in the former category and refers to both the act of hiring a civilian into a position in the Army and staffing or assigning job duties to a civilian who may or may not be a new hire. Here, there is an implicit assumption that individuals hired and staffed to civilian positions meet the job requirements for that position.

Next, there are four management support activities. *Provide training support* refers to time, funding, or other resources allocated to train new competencies or refresh previous competencies either as an internal or external activity. *Provide facilities and equipment* refers to the furnishing of any office or specialized equipment civilians may need to perform their job. *Provide retention support* is intended to cover a broad span of programs and incentives that management can conduct or provide to retain civilians in their jobs or within the Army. Examples include pay incentives or support for professional development, the latter of which has some overlap with providing training support. This is meant to ensure some of the noted benefits of maintaining a significant civilian workforce in the Army: continuity, institutional memory, and experience. The final activity is to *provide oversight*, which covers management at the individual and organizational levels and could include career development planning at the individual level as well as ensuring that organizational systems and structures support robust career options.

Outputs

The outputs connect to activities and provide indicators that the process is producing ready civilians. *Civilian workforce sufficiently staffed* as an output addresses capacity or having the right number of people. Together, *civilians meet job requirements* and *civilians sufficiently trained for their jobs* address the need for people with the right skills and competencies. The former relies on the policy element, mission requirements, to be a well-defined standard of readiness and would be checked at the hiring phase and periodically revisited in case requirements change or the person's ability to meet requirements changes. The latter accounts for training that a civilian might have when hired as well as any subsequent training needed to maintain or enhance skills and competencies. *Civilians fully and appropriately equipped and sited* acknowledges that most civilian occupations will require some potentially specialized equipment to perform their jobs and provide a capability. The last output, *institutional memory and experience preserved*, is slightly different in character and may be unique to the civilian workforce because it directly speaks to the key value added by the civilian workforce and the fact that most civilians have longer tenures in relevant positions than military personnel. These Army civilian workforce outputs have distinct parallels with military readiness reporting, and we expand on this further in Box 3.1.

Outcomes

Generally, the outcome of the process that we are describing is the readiness of the Army civilian workforce. As discussed in the previous chapter, we define *readiness* as the capability of civilians to support Army missions and the state of having the right number of people with

BOX 3.1

Military Readiness Resources

There is a strong history and understanding on the military side of the Army that resources affiliated with readiness are personnel, training, equipment on hand, and status of equipment, all of which most military units must report on each month. These resource ratings state whether the unit has the right number and skill level of personnel, is able to get a certain percent of its personnel to complete the training requirements, and has both the quantity and quality of equipment that it needs to execute the mission for which it was designed. All of these align roughly with the outputs in our logic model, except that our logic model includes “institutional memory and experience preserved,” which we note as being distinctive for the Army civilian workforce.

SOURCE: Chairman of the Joint Chiefs of Staff Instruction 3401.02B, *Force Readiness Reporting*, May 31, 2011, current as of July 17, 2014; Army Regulation 220-1, 2010.

the right set of skills and competencies in the right jobs at the right time. Note that this definition builds on the logic model outputs by adding the dimension of providing a capability to support Army missions, which is a demonstration of readiness. An organization’s definition of readiness can serve as an anchor to the logic model, and we highlight an example of how the definition of another organization, the U.S. Department of Homeland Security (DHS), has implications for readiness assessment and the types of outcomes it seeks (see Box 3.2).

For the logic model outcomes, we break readiness into its different levels in alignment with the discussion in the previous chapter. For *individual readiness*, think of an individual that meets all the technical and nontechnical job requirements and provides a capability. At the next level, there is either *organizational readiness* (e.g., within a program) or *functional readiness* (i.e., within a career field), which is achieved by having the right number of people with the right set of skills and competencies in the right jobs at the right time with the right supports that provide a capability. Here, *right supports* refers to such things as support staff, specialized equipment, or specialized training. Lastly, there is *Army operational and strategic readiness*, which refers to the existing definition of Army operational readiness—the ability to provide and support CCDRs’ OPLANs with trained and ready forces in the quantity and with the capabilities required to achieve the operational requirements for Army forces—and acknowledges that Army operational readiness is a dimension that makes up the Army strategic readiness picture.⁴ Organizational or Army performance, or both, reflect the Army’s operational and strategic readiness to achieve its overarching goals.

⁴ Army Regulation 525-30, 2020.

BOX 3.2

**Civilian Readiness in Other U.S. Government Organizations:
Department of Homeland Security Workforce Readiness**

DHS defines workforce readiness as “[t]he capability of an individual, unit, or system to perform the missions or functions for which it was intended or designed.”^a Because the tasks required to advance the department’s mission are physically and mentally taxing, ensuring that DHS personnel are healthy and can carry out their individual roles represents a key aspect of achieving readiness. In 2014, at the DHS Office of Health Affairs’ request, the Institute of Medicine (IOM) authored a report that found that within DHS, organizational readiness is a function of two factors: (1) a medically ready workforce, meaning “free of health-related conditions that would impede its ability to participate fully in operations and achieve mission goals,” and (2) the department’s capability to have in place an operational medicine program that provides “medical support for the workforce” and other personnel who contribute to DHS operations.^b In this vein, the IOM recommended “the development of a common framework for assessing an individual’s capacity for achieving mission readiness both before and during employment with DHS. This framework should apply to employees in the field as well as those in more conventional workspaces and should establish an approach that identifies and mitigates physical and mental limitations on an individual’s ability to carry out the responsibilities of his or her position.”^c

^a IOM, *A Ready and Resilient Workforce for the Department of Homeland Security: Protecting America’s Front Line*, National Academies Press, 2013, p. 3.

^b IOM, *Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us*, National Academies Press, 2014, p. 2.

^c “Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us,” *Military Medicine*, Vol. 181, No. 2, February 2016, p. 94.

Perspectives on Enablers and Barriers to Civilian Workforce Readiness

We asked interviewees from across the Army and DoD to share their views about factors that either support or inhibit civilian workforce readiness. Several organizational and individual factors were mentioned as contributing to readiness. Interviewee responses highlighted the fact that both organizational units (e.g., work units and commands) and functional units (e.g., career programs) play overlapping roles as enablers. Organizational factors included funding for training, high-quality onboard programs, mentorship, and information about development opportunities. All of these enablers could be provided by work units, commands, or career programs. Providing organizational and functional decisionmakers with the flexibility to allocate resources across locations or employees was also mentioned as an enabler of civilian workforce readiness. Interviewees also mentioned characteristics of individual work-

ers that enable readiness by increasing the odds that a worker will meet the Army's requirements now and in the future. These characteristics were not hard skills or role requirements per se, but crosscutting soft-skills that could apply to workers Army-wide. Those mentioned most frequently were adaptability to change, interest in professional self-improvement and career advancement, the ability to interact well with other communities within the Army ("greening"), and the ability to think independently and creatively.

In describing challenges or factors that impede readiness, interviewees frequently mentioned that limitations in requirements information prevent managers from understanding the target against which the workforce should be assessed. They mentioned that PDs and requirements data are out-of-date and not readily available. Interviewees also pointed to limitations of key strategic workforce-management processes that threaten readiness, such as slow hiring processes, hiring processes that fail to ensure those hired meet requirements, shortfalls in professional development that fail to ensure that current workers meet current job requirements (early-career training or on-boarding), or that the pool of future workers will meet future workforce needs (e.g., leadership development). Interviewees also emphasized that the personnel assessment process often fails to assess whether current workers have the competencies required for the job. What follows are some key examples that stood out in our analysis of the interview data regarding barriers to civilian workforce readiness.

Several interviewees pointed to out-of-date PDs as a key barrier to workforce readiness. They noted that some PDs have not been updated in decades, which leads to a misalignment between manning requirements and the actual skills and competencies that an employee currently needs to perform their job. This misalignment between the official PD and the actual skills that hiring managers seek makes it difficult to hire the best candidate for the job.

Interviewees also pointed to challenges facing the Army in filling positions—that is, finding individuals who meet the requirements of a position—especially in such occupational series as nursing and IT management. Army officials noted that the private sector can offer better compensation and working conditions. Additionally, positions with special requirements, such as the ability to deploy, can be particularly difficult to fill. Interviewees also highlighted a tension between filling a vacancy within the timeline prescribed by Army policy and hiring the most competent individual for the job, with the former taking precedence over the latter—especially when filling positions in highly competitive fields such as cybersecurity. To avoid losing a position, the Army ends up hiring individuals who barely meet the competency requirements.

Several interviewees mentioned that Army organizations could lose a position if they are unable to fill a vacancy within a prescribed timespan because of the Army's budgeting approach. For openings in highly competitive fields, managers may be inclined to hire a candidate who barely meets the competency requirements to avoid losing a position entirely.

Summary

To achieve readiness in the Army civilian workforce, there is a process that involves policy, resources, activities, outputs, and outcomes. Our logic model shows the various elements that feed into our definition of readiness. The logic model can also be leveraged as a framework for considering metrics and measuring the readiness of the Army civilian workforce. When assessing readiness, the Army should ideally focus on outcomes or outputs while considering the policies, resources, and activities upstream as levers that affect readiness. In the next chapter, we examine potential readiness metrics with respect to the logic model framework.

Metrics for Assessing Civilian Workforce Readiness

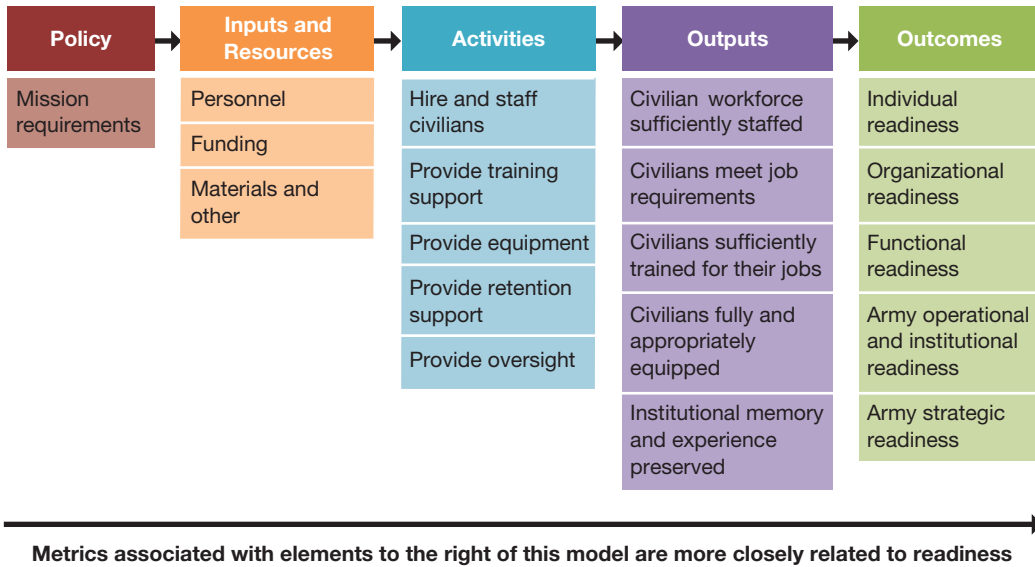
Through our various review efforts, we had hoped to identify concrete best practices for developing readiness metrics that were applicable to the civilian workforce. However, our literature review revealed that few private sector or government organizations have been able to successfully identify, operationalize, and employ metrics that evaluate readiness at both the individual and organizational level (see Appendix B). As a result, we leveraged the logic model described in the previous chapter to consider how the Army should measure civilian workforce readiness. The general approach was to (1) identify metrics that have been proposed or are already in use, such as metrics found in the Army's CIP, and (2) place the metrics within the logic model to better understand their relationship to readiness. This chapter describes our approach and the resulting metrics.

Connecting Readiness Metrics to Our Readiness Framework

We used the readiness framework described in the previous chapter to guide our metrics identification efforts. The framework provides a structure through which we can evaluate whether various measures in fact relate to readiness. Figure 4.1 illustrates that metrics associated with elements further to the right of the logic model are more closely related to readiness itself and are therefore preferable. Metrics related to *activities*, such as the number of new hires over the past 12 months or the certifications held by current employees, shed light on characteristics of the current workforce. However, these metrics cannot convey information about readiness without a target or requirement. Is the number of new hires adequate? Are the certifications adequate? Without a requirement, we cannot answer such questions.

In contrast, metrics related to *outputs* compare observed characteristics with a target or requirement and are therefore better suited to measuring readiness. For example, the metric *fill rate*, which is associated with the output element *civilian workforce sufficiently staffed*, compares the current number of employees (the supply) with the current number of authorizations (a proxy for the demand). It presumes that the higher the fill rate, the closer the organization is to achieving readiness.

FIGURE 4.1
Relationship Between the Logic Model and Readiness Metrics



The logic model also captures aspects of readiness that the collection of metrics should address. The elements listed under *outcomes* reflect different levels of readiness—individual, organizational, functional, and strategic—as described in the previous chapter. The elements listed under *outputs* and *activities* can be organized into four readiness aspects:

- **Fill** refers to whether a position is staffed. Related activities fall under *hire and staff civilians* and *provide retention support*; related outputs fall under *civilian workforce sufficiently staffed*.
- **Fit** refers to an employee’s knowledge, skills, and abilities (KSA), both technical and nontechnical. Related activities fall under *hire and staff civilians*, *provide training support*, and *provide oversight*; related outputs fall under *civilians meet job requirements* and *civilians sufficiently trained for their jobs*.
- **Equipment** refers to the tools the employee needs to perform their job. Equipment might be individually assigned to an employee or shared among multiple employees. Related activities fall under *provide equipment* and *provide oversight*; related outputs fall under *civilians fully and appropriately equipped*.
- **Continuity** refers to the preservation of institutional memory and experience. Related activities fall under *provide retention support* and *provide oversight*; related outputs fall under *institutional memory and experience preserved*.

Data captured at the individual level can be rolled up to assess readiness at the organizational and functional levels. For example, data on specific skills and certifications can be collected for each employee. When measured in relation to explicitly stated job requirements,

the data can be used to assess readiness at the individual level. The individual metrics can then be aggregated to assess readiness at higher levels: Aggregating within a program provides an assessment of organizational readiness, while aggregating within a career field provides an assessment of functional readiness.

Some aspects of readiness, such as continuity, make sense only at higher levels of assessment because they consider the skills and experience of the workforce as a whole. Nevertheless, the data to support these metrics are also tracked at the individual level. For example, while a worker's average number of years in the organization (and the associated variance) could be used to assess continuity at the organizational level, the data required to construct the metric are collected at the individual level.

Table 4.1 summarizes the main goals of readiness metrics and assessments at the individual and organizational and functional levels.

In the next section, we compile a list of candidate metrics for assessing civilian readiness. We then evaluate each metric in terms of validity, reliability, and feasibility. Finally, we return to the logic model to whether the more viable candidate metrics adequately cover the various aspects of readiness.

Identifying Civilian Readiness Metrics

We identified appropriate metrics for measuring Army civilian readiness using a two-step process. First, we compiled a list of potential metrics comprising (1) metrics proposed by the

TABLE 4.1
Objectives of Readiness Metrics

Level	Aspect	Metric Should Assess	By Measuring Against	Example
Individual	Fit	The individual's KSA, both technical and nontechnical	Job requirements, both technical and nontechnical, as described in the PD	Indicator of whether the individual has completed required training
Organizational or functional	Fill	The number of employees	The number of positions needed to execute the mission	Percentage of authorized positions filled (i.e., fill rate)
Organizational or functional	Fit	The employee's KSA, both technical and nontechnical	The technical and nontechnical job requirements for the position	Percentage of employees who have completed required training
Organizational or functional	Equipment	Tools and equipment assigned or available to the employee	Tools and equipment required to perform the duties associated with the position	Percentage of employees who have required equipment
Organizational or functional	Continuity	The tenure or experience of the workforce	The tenure or experience profile needed to preserve institutional knowledge	Actual pay grade ratios in relation to desired pay grade ratios

Army working group as part of the Army's CIP efforts and (2) metrics proposed independently by our team based on our collective experience and expertise in readiness. We then assessed each of the metrics according to three criteria—validity, reliability, and feasibility—to reduce the list to those most closely associated with readiness assessment.

The CIP Working Group proposed several metrics to support the measure of civilian readiness, explicitly grouped into the areas of individual (“I-”), organizational and organizational staffing (“O-” and “S-”), and functional (“F-”) readiness. Independent of the working group, we developed a set of candidate metrics that are, in general, tracked at the individual level then aggregated to provide organizational and functional level assessments of readiness. Because we developed our list independently, there is overlap between the lists. Table 4.2 identifies the collective set of candidate metrics proposed by the CIP Working Group, our team, or both. The metric itself is described in the first column. The second and third columns indicate whether the metric was proposed by the working group, by our team, or by both. If the metric was proposed by the working group, the corresponding metric number (according to the working group's numbering) is provided.

Although Table 4.2 shows some metrics proposed by both the CIP Working Group and our team, these are not completely accurate. In some instances, the proposed metrics agree in terms of the characteristics that they are assessing but differ in terms of what exactly is being measured and how the results are used. In these instances, we have found that the CIP Working Group's definition and calculation of the metric may not directly convey anything about readiness because it is not clear what a threshold or benchmark might indicate.

For example, the working group's definition of the *education level* metric (Table 4.2) suggests that comparing the overall education levels of employees within a career field to the overall Army civilian workforce. Here, we do not see the value in comparing education levels within a given career field with those of the entire civilian workforce because different occupations require different levels of education. It would be more beneficial to tie education level to a position requirement to ensure that the individual filling a position has achieved the appropriate level of education.

Table 4.3 summarizes suggested modifications to certain CIP-proposed metrics that would improve their validity. The metrics and their current definitions as proposed by the working group are shown in columns 1 and 2. The third column describes our proposed modifications to the metrics. The remainder of the analysis assumes our proposed modifications to these metrics, so metric description may differ slightly from that appearing in Table 4.2.

Some metrics were proposed by the CIP Working Group but not independently identified by our team. This does not necessarily imply that such metrics are not useful, only that they were not metrics that our team had included in our list. In several cases, the reader will see that these metrics tend to be associated with activities that support readiness rather than with readiness outputs themselves, the latter of which was the focus of our team.

TABLE 4.2
Collective Set of Candidate Metrics

Metric	CIP Metric?	RAND Metric?
Employee has proper resources or tools for position	Yes (I-1)	Yes
New hires complete acculturation process	Yes (I-2)	
Employee has necessary certifications or licenses for position	Yes (I-3)	Yes
Employee has approved Individual Development Plan (IDP)	Yes (I-4)	
Employee has approved performance plan	Yes (I-5)	
Employee has the appropriate technical skills for position	Yes (I-6)	Yes
CES Basic Course fill rates and graduation rates	Yes (I-7)	
CES Intermediate Course fill rates and graduation rates	Yes (I-8)	
CES Advanced Course fill rates and graduation rates	Yes (I-9)	
Continuing education for senior leaders fill rates and graduation rates	Yes (I-10)	
Supervisors properly trained	Yes (O-1)	
Average time to hire	Yes (O-2)	
Hiring lag	Yes (O-3)	
Civilian workforce is properly equipped ^a	Yes (O-4)	Yes
Execution of Army civilian pay	Yes (O-5)	
Execution of Army civilian training and development resources	Yes (O-6)	
Appropriated fund military function civilian fill rate	Yes (S-1)	
Other than APF military function civilian fill rate	Yes (S-2)	
Fill rate	Yes (S-3)	Yes
Number of new hires	Yes (S-4)	
Workforce losses	Yes (S-5)	
Non-retired workforce losses	Yes (S-6)	
Geographic dispersion	Yes (F-1)	
Command disposition	Yes (F-2)	
Pay structure	Yes (F-3)	Yes
Education level	Yes (F-4)	
Veteran status	Yes (F-5)	
Diversity, ethnicity, and inclusion status	Yes (F-6)	
MCO and STEM composition	Yes (F-7)	Yes
Attrition and accessions	Yes (F-8)	Yes

Table 4.2—Continued

Metric	CIP Metric?	RAND Metric?
Workforce retirement eligibility	Yes (F-9)	
Army Fellows Program participation	Yes (F-10)	
Future workforce trends	Yes (F-11)	
Leader readiness concerns	Yes (F-12)	
Employee meets physical requirements for position		Yes
Employee meets other nonphysical and nontechnical requirements for job ^b		Yes
Employee has completed necessary training requirements ^c		Yes
Number of years in position		Yes
Number of years in organization		Yes
Number of years in the Army		Yes

SOURCE: U.S. Army, “Army People Strategy—Civilian Implementation Plan, Civilian Readiness Information Requirements Pilot Review (Task E-1.3.2),” briefing, March 10, 2022, Not available to the general public.

NOTE: CES = Civilian Education System; MCO = mission critical occupation; STEM = science, technology, engineering, and mathematics.

^a This is an aggregation of an individual metric.

^b There may be additional miscellaneous job requirements, including having up-to-date vaccinations, having a current passport, and maintaining an appropriate security clearance.

^c This is related to the CIP Working Group’s proposed metrics I-7, I-8, I-9, and O-6, but is different in that it tracks (all required) training completion at the individual level.

Evaluating the Candidate Metrics

To determine whether each of the proposed metrics is a promising candidate for further inclusion in readiness assessments, we evaluated each against three distinct criteria: validity, reliability, and feasibility.¹ *Validity* refers to the extent to which the metric captures what is needed. In this analysis, one might think of validity in relation to how far to the right the metric falls in the logic model. *Reliability* captures the consistency of the metric. Are the data or measurements objective or subjective? Are the metrics constructed with these data computed using an established process? Reliability of the metric is essential to make valid comparisons across segments of the workforce over time. Lastly, *feasibility* speaks to the ease of data collection associated with the metric. Each metric was assigned a rating—high, medium, or low—for each of the three criteria using the conditions described in Table 4.4.

¹ The criteria were derived from Stephanie Young, Henry H. Willis, Melinda Moore, and Jeffrey Engstrom, *Measuring Cooperative Biological Engagement Program (CBEP) Performance: Capacities, Capabilities, and Sustainability Enablers for Biorisk Management and Biosurveillance*, RAND Corporation, RR-660-OSD, 2014.

TABLE 4.3
Proposed Modifications to Certain Candidate Metrics

Metric	CIP Description	Adjustment(s) Proposed by RAND
Pay structure	Comparison of the grade structure distribution in the career field with that in the Army civilian workforce overall	Grade structure should be tied to position requirements, targets, or both for workforce distribution, not the Army average
Education level	Comparison of the education level in the career field with that in the Army civilian workforce overall	Education level should be tied to position requirements, not the Army average
MCO and STEM composition	Comparison of the prevalence of MCO and STEM occupations in the career field to that in the Army civilian workforce overall, for example: <ul style="list-style-type: none"> • Top ten occupational series by number of employees in civilian function • Percentage of STEM employees in career field 	Fill rates for MCO and STEM positions
Attritions and accessions	Attrition and accessions in career field, for example: <ul style="list-style-type: none"> • Percentage of losses in attrition reason categories • Percentage of gains and losses, by age group 	Attrition and accession rates should be tied to workforce targets

NOTE: Attrition reason categories that are captured in the personnel data include retirement, voluntary separation, involuntary separation, death, and transfer to another DoD organization.

TABLE 4.4
Assessment Criteria for Candidate Metrics

Rating	Validity: To What Extent Does the Metric Capture Readiness?	Reliability: How Consistent Would the Measure Be?	Feasibility: How Easy Is It to Collect the Requisite Data?
High	Metrics or data are directly associated with readiness measurement	Data are objective, and there are established processes for using data in calculations	Relevant data likely are currently available
Medium	Metrics or data are associated with a process or activity that supports readiness	Data are objective, but there are no established processes for using data in calculations	Relevant data likely are not currently available but could be collected with minimal effort
Low	Metrics or data are not associated with readiness measurement	Data reflect subjective assessment or there are no established processes for using data in calculations, or both	Relevant data are currently unavailable and are likely difficult to collect

SOURCE: The assessment criteria were derived from Young et al., 2014. The application of the criteria is the product of our analysis.

We illustrate the assessment process and our reasoning using three candidate metrics and their ratings, as shown in Table 4.5. Consider the first metric, *employee has necessary certifications or licenses for position*. This metric ranks high in terms of validity because it speaks directly to one of the readiness outputs, *civilians meet job requirements* (see Table S.1). The metric also ranks high in terms of reliability because employees would (or should) be required to provide proof of proper certification or licensure (e.g., date of completion or expiration date).² Finally, we assign a medium rating to feasibility because the data to support this metric are not collected broadly across the civilian workforce, although some segments of the workforce have shown it possible to collect such data. The acquisition workforce, for example, collects certification data, as discussed in Chapter 5.

The second metric in Table 4.5, *employee has the appropriate technical skills for position*, is rated high in terms of validity because it also speaks directly to *civilians meet job requirements*. We rank the metric low to medium with respect to reliability, however, because the data might be impacted by subjective assessment if the employee is responsible for reporting their own technical abilities (e.g., the employee may falsely inflate their technical skills during reporting).³ The metric is assigned a medium rating in terms of feasibility because this is, once again, a metric for which data do not appear to be collected but are likely relatively easy to incorporate, for example, an indicator parameter to track the data.

Lastly, we consider the geographic dispersion metric proposed by the CIP Working Group. We rate the validity of this metric as low because it does not appear to be directly associated with any readiness assessments; that is, it does not appear to speak directly to any of the outputs identified in the logic model. However, the metric ranks high in terms of both reliability and feasibility because a candidate’s geographic location is readily available via the locality pay area and duty station zip code variables available in the DMDC civilian databases.

Assessment results for all candidate metrics can be found in Appendix E. We found that several of the metrics proposed by the CIP Working Group fall short on validity. In other words, these metrics do not measure readiness itself but rather *activities* or *inputs*—and

TABLE 4.5
Example Candidate Metrics Assessment

Candidate Metric	Validity	Reliability	Feasibility
Employee has necessary certifications or licenses for position	High	High	Medium
Employee has the appropriate technical skills for position	High	Low–Medium	Medium
Geographic dispersion	Low	High	High

² The validity ranking could drop if employees were required *only* to self-report that they hold the necessary certifications or licensures without providing proof.

³ The tracking and reporting of technical skills may present challenges. How do you assess one’s technical skills against job requirements, particularly if there are many? Must employees complete an assessment to demonstrate their skills? Should employees self-report their skills? As noted, self-reporting can lead to subjective assessments.

often the former—that generate or support readiness. For example, onboarding and acculturation programs for new employees might be quite valuable, but their link to readiness is not well established. How exactly does participation in acculturation programs indicate a ready individual or workforce? Such programs potentially contribute to retention, which affects fill rate and the long-term preservation of institutional knowledge and memory. However, these programs are several steps removed from readiness at best. Because a higher validity rating suggests that the metric is more directly associated with readiness, we focus the remainder of our analysis on the most-promising metrics that have been assigned a high or medium validity rating. Concerns relating to reliability and especially feasibility will be discussed as appropriate.

Aligning More-Promising Metrics with the Logic Model

To determine whether the proposed metrics cover the various aspects of readiness, we place the more-promising metrics within the logic model. Table 4.6 aligns the metrics that were assigned a high validity rating with the elements listed under *outputs* in the logic model. Table 4.7 aligns the metrics that were assigned a medium validity rating with the elements listed under *activities* in the logic model. None of the metrics align with the elements listed under *outcomes* in the logic model because the readiness outcomes are somewhat abstract.

The structure of Tables 4.6 and 4.7 reflects the organizing principles described at the beginning of the chapter. The rows are identified not only by the elements that appear in the logic model (e.g., civilian workforce sufficiently staffed) but also by the readiness aspects that correspond (e.g., fill). The columns indicate the readiness level (individual, organizational and functional).

A closer look at the metrics listed in Table 4.6 reveals that most are defined or framed in relation to a target or requirement. For example, the first item in the *civilians meet job requirements* row and *individual* column is *employee possesses the education level **required by the position*** (emphasis added). The individual's education level (the supply component) is measured against the education level required by the position (the demand component). This is consistent with the metric having been assigned a high validity rating (see Table E.1) or being more-closely associated with readiness.

Table 4.6 indicates that high validity metrics exist at both the individual level and the organizational and functional levels. Many of the metrics in the latter category are simply aggregations of metrics computed at the individual level.⁴ For example, *employee is current on required training* is tracked at the individual level because each individual has their own distinct training requirements. However, the metric is aggregated across an appropriate set of individuals (e.g., across a program or career field) to compute the percentage of *employees current on required training*.

⁴ This is not necessarily the case for the metrics listed in Table 4.6 (activities).

TABLE 4.6
Metrics That Relate Directly to Readiness Outputs

Output	Aspect	Candidate Metrics	
		Individual Level	Organizational or Functional Level
Civilian workforce sufficiently staffed	<ul style="list-style-type: none"> • Fill 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Fill rate • Fill rate for critical positions (e.g., MCO, STEM)
Civilians meet job requirements	<ul style="list-style-type: none"> • Fit 	<ul style="list-style-type: none"> • Employee possesses education level required by position • Employee possesses proper certifications or licenses, or both • Employee possesses technical skills required by position • Employee meets physical requirements for the position • Employee meets other nontechnical and nonphysical job requirements (e.g., vaccinations, passport, security clearance) 	<ul style="list-style-type: none"> • Percentage of employees with required education level • Percentage of employees with required certifications or licenses, or both • Percentage of employees with required technical skills • Percentage of employees meeting physical requirements • Percentage of employees meeting other job requirements (e.g., vaccinations, passport, security clearance)
Civilians sufficiently trained	<ul style="list-style-type: none"> • Fit 	<ul style="list-style-type: none"> • Employee has completed necessary training requirements 	<ul style="list-style-type: none"> • Percentage of employees that have completed training requirements
Civilians fully and appropriately equipped	<ul style="list-style-type: none"> • Equipment 	<ul style="list-style-type: none"> • Employee has proper resources or tools for position 	<ul style="list-style-type: none"> • Percentage of employees with proper resources or tools
Institutional memory and experience preserved	<ul style="list-style-type: none"> • Continuity 	<ul style="list-style-type: none"> • Number of years in the position • Number of years in the organization • Number of years in the Army • Retirement eligibility^a 	<ul style="list-style-type: none"> • Average number of years in the position • Average number of years in the organization • Average number of years in the Army • Percentage of workforce eligible for retirement • Attrition and accession rates consistent with workforce targets

NOTE: N/A = not applicable.

^a Consideration of retirement eligibility (e.g., number and percentage of individuals eligible for retirement within the next five years and the number of employees in specified years of service categories as proposed by the CIP Working Group) is relevant to the extent that it informs future workforce planning, including recruitment and hiring processes.

TABLE 4.7
Metrics That Relate to Activities That Support Readiness

Activity	Aspects	Candidate Metrics	
		Individual Level	Organizational or Functional Level
Hire and staff civilians	<ul style="list-style-type: none"> • Fill • Fit 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Average time to hire • Accession rate • Number of new hires, by type • Execution of Army Civilian pay
Provide training support	<ul style="list-style-type: none"> • Fit 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Execution of Army Civilian training and development resources
Provide equipment	<ul style="list-style-type: none"> • Equipment 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Provide retention support	<ul style="list-style-type: none"> • Fill • Continuity 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Healthy or proper pay structure • Attrition rate • Workforce losses, by type (e.g., non-retirement)
Provide oversight	<ul style="list-style-type: none"> • Fit • Equipment • Continuity 	<ul style="list-style-type: none"> • Employee has approved IDP • Employee has approved Performance Plan • Supervisor has completed required training 	<ul style="list-style-type: none"> • Percentage of employees with an approved IDP • Percentage of employees with an approved Performance Plan • Percentage of supervisors that have completed required training

NOTE: N/A = metrics were not investigated or explored.

Table 4.6 is not exhaustive, but it provides adequate coverage of the metrics that directly relate to readiness. The collection includes metrics for fit, equipment, and continuity at both the individual level and the organizational and functional level. Metrics for fill are provided at the organizational and functional level only because the individual-level metric is not useful.

Some of the metrics are quite specific and, at least in theory, can be measured for all segments of the Army civilian workforce. For example, the fill rate metric is relevant regardless of the occupation or organization under consideration.⁵ However, the targets or benchmarks associated with the fill rate metrics might vary with occupation or organization, or both. Other metrics in the table are described in more-general terms and require tailoring for the specific occupation or organization of interest. Consider, for example, the metrics in the training row. Because required training varies with occupation and organization (and perhaps position as well), these metrics must be defined specifically for the occupation or organization under consideration.

⁵ The fill rate for MCOs and STEM occupations does not necessarily apply broadly.

When designing such metrics, the reliability and feasibility criteria should be kept in mind to ensure that dependable and consistent data can, in fact, be collected. The metrics evaluation detailed in Appendix E indicates that metrics related to an employee's technical skills might suffer from low reliability if they are derived from employee self-reports, which could be subjective. Metrics related to equipment might suffer from low reliability if they are derived from subjective assessments by management and from low feasibility if the data on equipment inventory and usage are not available.

Table 4.7 aligns the candidate metrics that were assigned a medium validity rating with the elements that fall under *activities* in the logic model. These metrics relate less directly to readiness but capture activities that might support readiness. In some cases, the relationship between the activity and readiness has not been established or is not well understood. For example, while the *average time to hire* metric clearly affects the *fill* of civilian positions, its relationship to *fit* is more ambiguous. On the one hand, delays in the civilian hiring process might result in qualified candidates accepting positions elsewhere, possibly in the private sector. On the other hand, excessive emphasis on shortening the time to hire might lead managers to select less qualified candidates to meet hiring deadlines.

Unlike the *outputs* metrics (shown in Table 4.6), many of the *activities* metrics (shown in Table 4.7) are not defined or framed in relation to a target or requirement. For instance, the *average time to hire* metric does not reference a benchmark. Moreover, it is not clear what an appropriate benchmark would be, since (1) there is no documented requirement for the metric and (2) the relationship between the metric and readiness is not well understood.

Despite the issues with validity, *activities* metrics are frequently considered or proposed because they tend to rate high on reliability and feasibility. Many of the metrics listed in Table 4.7 are computed using administrative data that are objective and collected regularly using established processes. For example, the accession, attrition, and pay grade metrics can be computed using DMDC data. Nevertheless, the validity issues remain; therefore, the *activities* metrics are better thought of as a noisy signal of a potential readiness issue than a measure of readiness itself.

Many of the cells in Table 4.7, particularly those in the *individual* column, do not contain metrics, as indicated by *N/A*. The vacancies do not indicate that there are gaps in the metrics landscape but rather that (1) the medium validity metrics proposed by the CIP Working Group relate principally to organizational and functional readiness and (2) our team's efforts were focused on developing high-validity metrics. Without an established and well-understood relationship between the activity and readiness, the activity metric might not serve the goal of assessing civilian readiness. For example, one might propose the metric *retention bonus paid for hiring/staffing civilians* activity at the individual level and argue that retention bonuses reduce attrition, thereby improving both fill and continuity. However, increasing retention could improve or impair readiness depending on the current pay grade or experience profile of the workforce.

Summary

Valid readiness metrics compare observed characteristics (supply) with a target or requirement (demand). The CIP Working Group proposed a set of 34 metrics, and we contributed another six metrics. However, many of the metrics proposed do not relate directly to readiness *outputs* or *outcomes* but instead measure *activities* that might support readiness. The metrics that do relate directly to readiness (that is, those with high validity) are broad enough to cover the major aspects of readiness: fill, fit, equipment, and continuity. These metrics are described in general terms and require tailoring for the specific occupation or organization of interest. In addition, some of the metrics present challenges with respect to reliability (whether data are objective and consistent) and feasibility (whether data are available or easy to collect). In the next chapter, we address data availability and improvements to data collection because these matters affect feasibility and, to a lesser extent, reliability.

Data to Support Readiness Assessments

The tailoring and computation of the metrics proposed in the previous chapter require systematic collection of appropriate data over time. In this chapter, we review several data sources, describing their readiness aspects and identifying gaps in the data. In addition, we describe a few initiatives that have endeavored to address some of these gaps for particular segments of the civilian workforce. We then offer some thoughts on whether the Army should consider extending the initiatives (or some of their features) to the larger population of Army civilian employees.

Existing Data Sources

As explained in Chapter 4, valid readiness metrics compare the observed characteristics of the civilian workforce (supply) with a target or requirement (demand). Administrative data that can be used to describe the size, shape, and attributes of the current workforce are relatively plentiful and well understood, although some gaps persist. However, data that capture requirements are both less plentiful and less reliable. The FEVS contains several items that solicit views on readiness *outputs* and *outcomes*, framing workforce characteristics or activities in relation to a requirement or mission.

Data on Workforce Characteristics

Several sources provide individual-level data on Army civilian personnel over time. DoD and Army civilian personnel files include demographic information, occupation, pay grade or band, and organization or command. These data are generally reliable and are reported at regular intervals (quarterly for most variables). The files also include performance review data, but these are often too coarse, incomplete, or unreliable to serve as a concrete measure of the performance of the current civilian workforce. Although the personnel files include the individual's general education level (e.g., high school diploma, bachelor's degree), they do not

include the associated discipline (e.g., history, engineering) or any job-specific qualifications, such as technical skills, completed training, or security-clearance level.¹

The Army Training Requirements and Resources System (ATRRS) database maintains training data for civilian personnel at the individual level. The database includes a record of the courses in which the employee enrolled and an indication of whether the employee completed the course. As a general matter, ATRRS does not include the certifications achieved by the employee.

The Defense Acquisition Workforce Improvement Act (DAWIA) requires that DoD collect data on positions and personnel within the acquisition workforce. The DAWIA files include more-detailed information on the employee's career field and the certifications they have achieved.² We describe these data and their utility in greater detail later in this chapter.

When paired with requirements data, the civilian personnel, ATRRS, and DAWIA data provide some information on the fill, fit, and continuity of the Army civilian workforce. However, we were not able to identify a data source that provides information on the equipment assigned to or used by Army civilians. Table 5.1 summarizes our understanding of current data sources and data collection efforts in relation to the more promising candidate metrics identified in Chapter 4.

Data on Workforce Requirements

Requirements data for the Army civilian workforce generally reside in one of two sources: FMSWeb or the federal government's FASCLASS. FMSWeb provides authorizations data at the individual position level, including occupation, pay grade or band, and organization or command. However, the utility of these data is limited because they cannot be matched easily with the personnel data to compute readiness metrics, such as fill rate.

FASCLASS houses PDs, which, unlike the authorizations data in FMSWeb, include information about the capabilities required for a position. PDs often stipulate the required level of education, certifications, technical skills, and years of experience. However, in many cases, the data fields are empty, contain vague information, or are out of date. For example, our review of a collection of PDs retrieved from FASCLASS indicated that the following data fields were frequently populated with "varies": drug test required, security clearance

¹ We requested data from the Army personnel file, ACPERS, for the purposes of this study, but we were unable to obtain the data in time to support this research. We were able to access and review DoD-wide data from the DMDC. Our review of the data dictionary for the ACPERS file suggests that the Army personnel data mirror the DoD-wide data from DMDC but are more comprehensive and include some position information. Although the position data do not appear to include many fields related to readiness, the Army civilian personnel files could provide a starting point for measuring civilian workforce readiness and could possibly be expanded to include more indicators.

² Although DAWIA refers to the act that requires data collection pertaining to the acquisition workforce. We will refer these data as DAWIA data.

TABLE 5.1

Tracking Status of Supply-Side Data Needed to Construct Civilian Workforce Characteristics

Appear to Be Tracked in Current Systems	Do Not Appear to Be Tracked, but Tracking Is Likely Easily Implemented	Do Not Appear to Be Tracked and May Be Difficult to Track
<ul style="list-style-type: none"> • Pay grade distribution • Education level • Training completed • Years in position, organization, or service • Retirement eligibility • Accession and attrition rates • Average time to hire 	<ul style="list-style-type: none"> • Technical skills • Certifications or licenses^a • Physical characteristics or ability • Miscellaneous job-specific qualifications^b 	<ul style="list-style-type: none"> • Equipment or tools assigned to or used by employee

^a The DAWIA files contain certification data only for the acquisition workforce.

^b Miscellaneous requirements include—but are not limited to—drug testing, vaccinations, current passport, and security clearance level.

level, emergency essential, and requires access to firearms.³ Moreover, the FASCLASS data cannot be matched easily with either the authorizations data in FMSWeb or the personnel data in DMDC.

The DAWIA files contain position-level data that include required certifications and can be matched with the personnel data. However, the DAWIA data cover a limited population: the acquisition workforce. We demonstrate how the DAWIA data can be used to construct readiness metrics for the acquisition workforce later in this chapter. Table 5.2 summarizes our understanding of current data sources and data collection efforts related to civilian workforce requirements. The items listed in the table reflect data needed to construct the more promising candidate metrics identified in Chapter 4.

Information provided by interviewees was consistent with our observation that data on workforce requirements are less plentiful and less reliable than data on workforce characteristics. The interviews revealed that neither functional nor organizational managers have a common go-to source of information about current workforce needs. Most notably, the consensus among interviewees who mentioned authorizations data and PDs was that these are not a reliable reflection of the current needs associated with the position. When probed on the reasons for the discrepancies, one interviewee reported that the administrative effort required to update the information would not yield benefits for those responsible for updating the source.

Nevertheless, if the Army aims to measure readiness, it must improve the collection of requirements data. There is room for improvement in the collection of data on workforce characteristics as well, but the primary bottleneck in conducting readiness assessments is

³ U.S. Department of the Army, “Army Position Description: Acquisition Workforce Senior Policy Analyst,” webpage, November 14, 2018; U.S. Department of the Army, “Army Position Description: Management Analyst,” webpage, June 9, 2007.

TABLE 5.2
Tracking Status of Demand-Side Data Needed to Construct Civilian Workforce Requirements

Appear to Be Tracked in Current Systems	Do Not Appear to Be Tracked, but Tracking Is Likely Easily Implemented	Do Not Appear to Be Tracked and May Be Difficult to Track
<ul style="list-style-type: none"> • Number of authorized positions • Required pay grade or band • Organization or command associated with the position • Occupation associated with the position 	<ul style="list-style-type: none"> • Required education level • Required technical skills • Required training • Required certifications or licenses, or both^a • Required years of experience • Miscellaneous job-specific qualifications^b 	<ul style="list-style-type: none"> • Equipment or tools required to perform job functions

^a The DAWIA files contain certification data only for the acquisition workforce.

^b Miscellaneous requirements include—but are not limited to—drug testing, vaccinations, current passport, and security clearance level.

the lack of data on workforce requirements in manpower databases. Making progress along this axis will require identification of the specific data needed to support readiness metrics, standardized processes for collecting the data, and mechanisms for data access and analysis that provide value to managers.

While many of the proposed readiness metrics require data on position-specific requirements, the recorded metric may be as simple as an indicator of whether a given requirement is met. For example, a particular nursing position might have specific certification or credential requirements that are stipulated in the PD, but the associated readiness metric recorded in the database could be a simple “yes” or “no,” indicating that the individual meets or does not meet the certification and credential requirements for the position.⁴ This approach reduces the burden of tracking the different types of certifications and credentials that are required across the many different civilian occupations and enables collection on a common platform. We note that reporting would need to occur on a regular basis, similar to the military’s monthly reporting requirements, to ensure accurate, up-to-date information.

Federal Employee Viewpoint Survey

Another potential source of qualitative (but structured) data to support readiness metrics is FEVS. Administered annually by the OPM to employees of executive branch agencies, this survey collects information on the work experience and work-related satisfaction of individuals. OPM publishes high-level results by federal agency and makes disaggregated data available to agencies for their own use. Using a review of recent FEVS survey items, we identified

⁴ This indicator could also be derived from the completion of the certifications and credentials—or their expiration dates—that the individual might have to submit.

some examples of FEVS items that speak directly to different components of the logic model and related metrics as shown in Table 5.3.

We note that some items speak directly to readiness *outcomes*. Employees' thoughts regarding the quality of work produced within their unit or agency can be linked to the assessment of individual readiness, while thoughts about their organization's achievement of its mission can be tied to the assessment of organizational readiness. Other items within FEVS can be associated with readiness *outputs* and *activities*. For example, the percentage of employees who agree that they have received the training needed to do their jobs well can inform an assessment of whether civilians are sufficiently trained for their jobs.

Readiness outcomes are somewhat abstract, and for this reason, the metrics that shed light on readiness outcomes tend to be subjective. The data collected through FEVS reflect employee perceptions in response to survey questions. Because they are subjective in nature, they rank lower in terms of *reliability*. However, the FEVS data offer the benefit of *feasibility* because they are collected, cleaned, and stored in a systematic fashion. An additional potential benefit of the FEVS data is that they allow for comparison across Army subunits, DoD agencies, and federal agencies. To expand use of FEVS data across the Army, the U.S. Army Civilian Career Management Activity (ACCMA) could develop recommendations for the analysis and use of FEVS data and develop comparative reports related to the readiness metrics outlined in Chapter 4 (see Table 4.5). Appendix D provides additional details on FEVS.

TABLE 5.3
Example Mapping of Federal Employee Viewpoint Survey Data to Logic Model Components

Logic Model	FEVS Item
Activity	
Hire and staff civilians	New hires in my work unit have the right skills to do their jobs.
Provide retention support	My supervisor supports my need to balance work and other life issues.
Output	
Civilians sufficiently trained for their jobs	I receive the training I need to do my job well.
Civilians fully and appropriately equipped	Employees are protected from health and safety hazards on the job.
Institutional memory and experience preserved	My work unit has the job-relevant knowledge and skills necessary to accomplish organizational goals.
Outcome	
Individual readiness	Employees in my work unit produce high-quality work.
Organizational readiness	My organization is successful at accomplishing its mission.

Initiatives to Further Develop Civilian Readiness Data and Metrics

This section describes four initiatives to collect data on specific populations of Army civilians and identifies ways in which the initiatives might be leveraged to measure readiness across the Army enterprise. The first initiative, driven by DAWIA, captures detailed and reliable data on the certification and qualification status of DoD acquisition workers. The next two initiatives—the Ready Army Civilian (RAC) Tool and the Career Mapping Tool (CMT)—represent initiatives under development by different Army commands to promote worker or career development. The final initiative, called the science, engineering, and analysis (SEA) Army Career Field Strategic Workforce Plan, identifies gaps in the Army’s SEA workforce and proposes strategies to close the gaps. While these initiatives have purposes other than measuring readiness, they could serve as models or data sources to measure readiness on a larger scale.

Defense Acquisition Workforce Improvement Act

In 1990, Congress passed the DAWIA to address long-standing concerns about the shortfalls in the quality of the defense acquisition workforce. DAWIA mandates that DoD maintain a certification structure for this workforce and that DoD components report about acquisition workforce positions (including the key requirements associated with the position, such as acquisition career field and certification level) and the people who fill those positions. The reporting requirements are outlined in DoD Instruction (DoDI) 5000.66 (2022), which specifies roles and responsibilities for defense acquisition workforce management and oversight.⁵ These responsibilities are shared between agency-wide functional area leads and organizational leads in the DoD components. Functional area leads are responsible for developing, overseeing, and updating competency models, PDs, and certification standards for their functional areas. Functional area leads also coordinate with the Defense Acquisition University to ensure the availability of professional development opportunities.

The Component Acquisition Executives (CAEs) are responsible for specifying the requirements for acquisition positions. As part of this responsibility, CAEs must associate positions with a functional area, specify the certification level, map the position into the acquisition career progression framework (as appropriate) by designating Critical Acquisition Positions and Key Leader Positions and identifying other position-specific requirements.⁶ This information is reported quarterly to DoD.

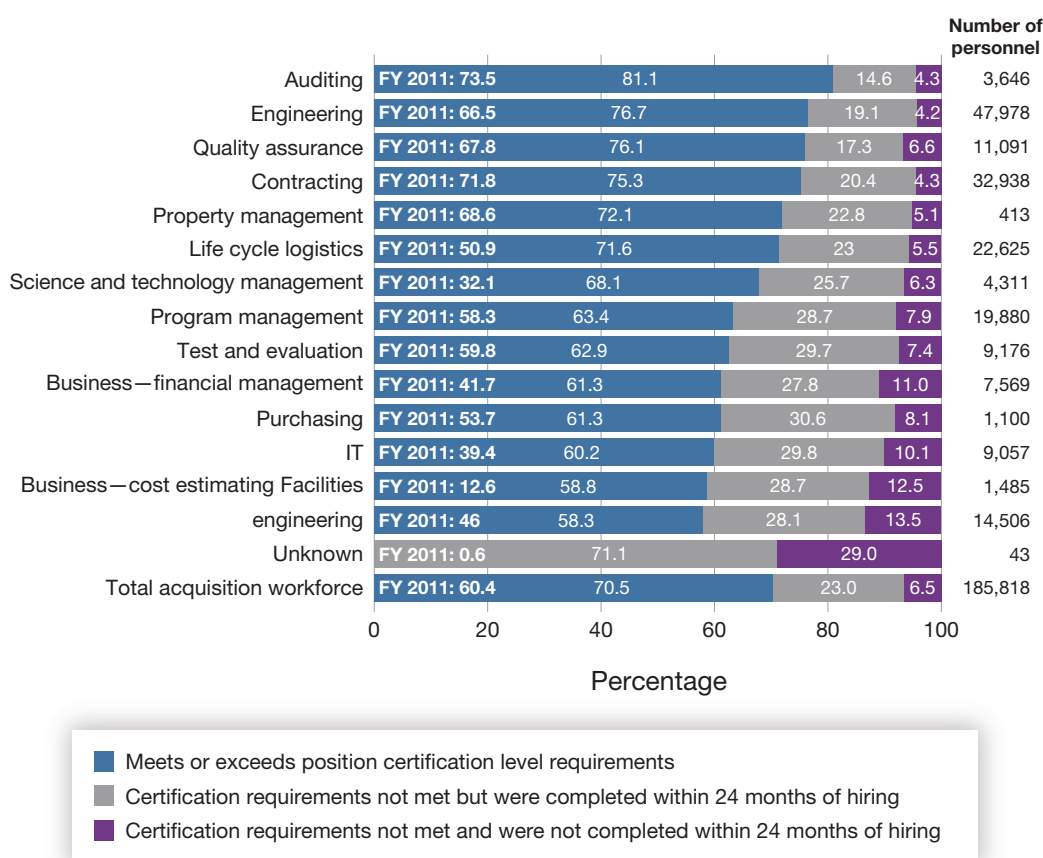
⁵ DoDI 5000.66, *Defense Acquisition Workforce Education, Training, Experience, and Career Development Program*, Office of the Under Secretary of Defense for Acquisition and Sustainment, updated March 25, 2022.

⁶ See DoDI 5000.66, 2022, p. 17.

Although the information reported by CAEs to DoD is at a high level, it is grounded in much more detailed competency analysis undertaken by functional area leads. The information can be used to assess the extent to which the current workforce meets the requirements and the paths new workers take to meeting requirements. Figures 5.1 and 5.2 depict examples of metrics that can be constructed using data available through DAWIA reporting files.⁷

Acquisition workforce personnel are required to become certified within two years of entering the workforce. Figure 5.1 summarizes the certification status of acquisition work-

FIGURE 5.1
Fiscal Year 2021 Certification Status of Acquisition Workforce Personnel, by Career Field

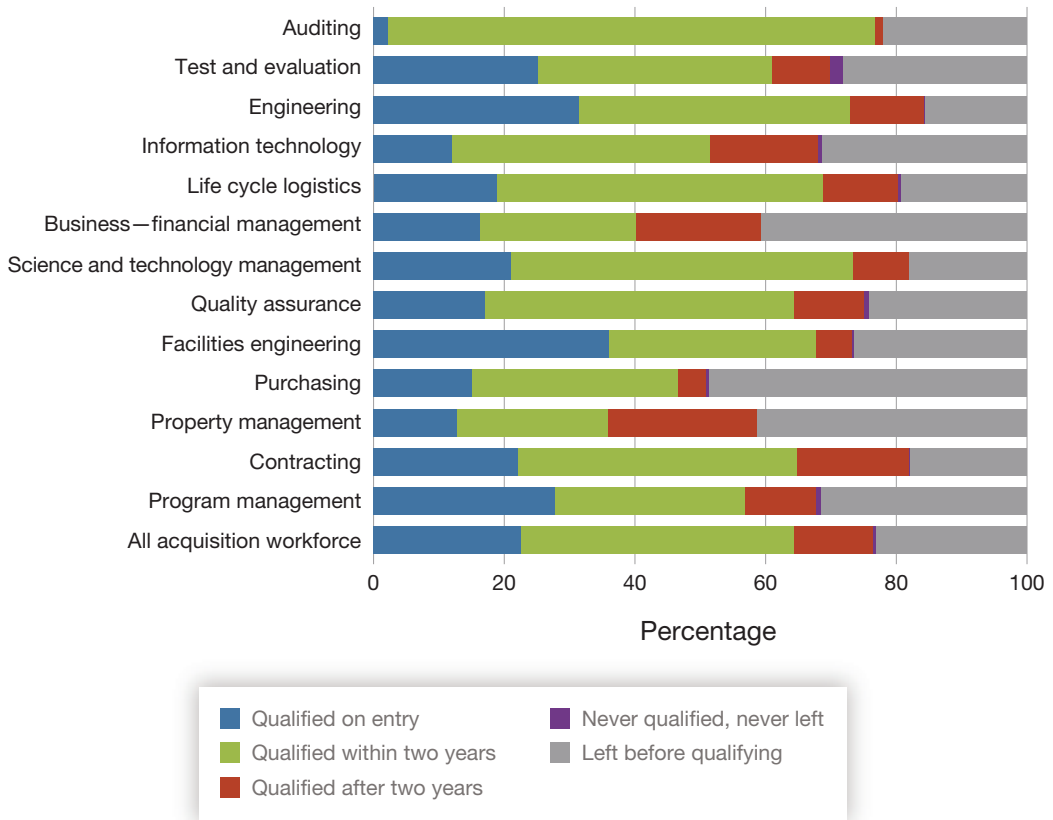


SOURCE: Adapted from Susan M. Gates, Elizabeth Roth, and Jonas Kempf, *Department of Defense Acquisition Workforce Analyses: Update Through Fiscal Year 2021*, RAND Corporation, RR-A758-1, 2022, Figure 3.7.

NOTE: Text in the left side of each bar reports the percentage of workers meeting or exceeding requirements in FY 2011.

⁷ The certification data were collected at the individual level and aggregated across career field to generate the figures.

FIGURE 5.2
Career-Level Attainment for Fiscal Year 2014 New Civilian Entrants to the Acquisition Workforce, by Career Field



SOURCE: Reproduced from Gates, Roth, and Kempf, 2022, Figure 3.8.

force personnel at the end of fiscal year (FY) 2021 by career field and time (within or beyond the two-year certification window). For example, data in the top bar indicate that 81.1 percent of personnel within the auditing field had met or exceeded their certification requirements, while 14.6 percent had not met their certification requirements but were still within the certification window (and thus still had time to complete the certification process to remain compliant). The remaining 4.3 percent had not met their certification requirements and were beyond the certification window (and thus in violation of policy). Additionally, the percentage of personnel within each field meeting or exceeding the certification requirements as of FY 2011 are shown at the very far left of each column, which allows for comparison across the ten-year period. For example, 73.5 percent of personnel in the auditing field met or exceeded certification requirements at the end of FY 2011, compared with 81.1 percent at the end of FY 2021. Such data allow the analyst to see that, in general, the percentages of individuals meeting or exceeding certification requirements improved between FY 2011 and FY 2021.

Figure 5.2 also considers certification status at the end of FY 2021 but focuses on personnel who entered their career fields for the first time in FY 2014 (i.e., new hires, recategorizations into the acquisition workforce, or current members of the acquisition workforce that changed career fields). In this figure, the top bar indicates that approximately three percent of personnel within the auditing field were qualified (certified) on entry into their positions, 73 percent became qualified (certified) within the two-year window, 2 percent became qualified after the two-year window, and approximately 22 percent left the workforce before completing certification. In some other fields, there was a small percentage of individuals who had not yet qualified (dark blue shading) after seven years on the job.

The previous two figures demonstrate that the acquisition workforce is an example population within the Army civilian workforce for which detailed data to support some aspects of readiness assessment are available. This shows that robust data collection is possible, although concerted efforts would be necessary to ensure proper and sufficient collection for the larger civilian workforce.⁸ DoDI 5000.66 could serve as a model for an Army-wide framework for requirements data collection in which Army career field managers play a similar role to acquisition functional area leads and commands (and other organizational subunits), taking on the roles outlined for the CAEs.

It is worth emphasizing that DAWIA reporting is limited to a small number of indicators for positions and people, which limits the reporting burden on organizational managers. It is also worth noting that there is still room for improvement regarding acquisition workforce position data reporting. For example, our analysis suggests that CAEs may be closing out position codes when a position is vacated and creating new codes when the same position is filled. The use of consistent position codes could support analyses of vacancies (including time to fill) and comparisons between those leaving and filling a vacated position.

Ready Army Civilian Tool

The RAC Tool collects information about the hard skills and soft skills of Army civilian employees, with a focus on an employee's readiness to carry out the requirements of his or her position. The tool was developed by the Army Materiel Command (AMC) for the purpose of encouraging conversations between supervisors and employees about employee development needs, building IDPs to close gaps in each employee's training and development, and providing AMC leadership with information to identify and close command-wide gaps using training and development programs.⁹ The RAC Tool was first used by employees in AMC headquarters in 2020 and 2021 and was extended to AMC subordinate commands in mid-

⁸ We conducted additional analyses to determine whether the DAWIA data could be leveraged to calculate meaningful fill rates and found that position data might not be reported for positions that are unfilled. If desired, reporting guidance could drive consistent reporting for unfilled positions.

⁹ Kari Hawkins, "Ready Army Civilian Tool Enables Better-Equipped Employees," U.S. Army, October 28, 2019.

2021.¹⁰ At the time of our interviews in spring 2022, interviewees stated that they were awaiting feedback on the tool from subordinate commands and that they planned to begin using the tool across the AMC enterprise.

The RAC Tool collects information about tangible *hard skills*, such as degrees, certifications, and the ability to travel and pass a drug test, and intangible *soft skills*, such as critical thinking, conflict resolution, and communication.¹¹ To use the RAC Tool, an employee answers questions through an internal SharePoint site, giving themselves a numeric rating in each category (e.g., conflict management). The employee's supervisor subsequently answers the same questions, and the employee and supervisor discuss any differences in their responses. When the employee and supervisor come to a reconciliation, the information is entered into a RAC database.¹²

The RAC Tool uses input from supervisors to capture the tangible requirements of each position. Before the supervisor and employee enter their ratings, the supervisor enters the position's requirements into the tool based on their understanding of the position. For example, the tool first asks the supervisor if the position requires a passport; if the supervisor indicates that a passport is required, the tool then asks the employee if they have one.¹³ This structure appears to be an effort to remedy the data issues noted earlier in this chapter: The inclusion of a requirements-reporting step is consistent with the observation that PDs are often incomplete, out of date, or unreliable, and the solicitation of employee and supervisor responses based on the reported requirements reflects the inability of the Army's current data systems to link personnel data to requirements data.

Data collected by the RAC Tool could help the Army evaluate civilian readiness if the tool were scaled up. Questions about soft skills could be administered to all Army civilians and their supervisors to supplement the administrative data on workforce characteristics currently available from DMDC and ATRRS. In addition, the questions about the hard skills or certifications required for particular positions could serve as a starting point for developing Army-wide reporting requirements for enterprise-wide tracking. For example, the Army could analyze the hard-skill requirements supervisors enter in the tool to develop a core set of readiness questions for all civilian employees.

A disadvantage of scaling up the RAC Tool would be the additional burden of participating in a labor-intensive data collection process that includes responding to questionnaires and holding discussions to reconcile differences between supervisor and employee ratings. Interview participants reported that less than 50 percent of employees responded when the tool was first launched. Because use of the RAC Tool was optional for employees and sepa-

¹⁰ Kari Hawkins, "AMC Launches Employee Development Tool Aimed at Readiness," U.S. Army, July 16, 2021b.

¹¹ Hawkins, 2021b.

¹² Hawkins, 2021b.

¹³ All employees receive the same questions about intangible soft skills.

rate from AMC's performance assessment process, there might have been little incentive for employees to exert the effort.¹⁴

Career Mapping Tool

At the time of this writing in summer 2022, the CMT, which is under development by the Deputy Assistant Secretary of the Army for Procurement (DASA[P]), will collect information about the knowledge, skills, behaviors, and preferences of contracting employees to assist with career planning.¹⁵ The CMT will (1) identify the knowledge and skills an employee would need to possess and the behavior gaps they would need to close to advance into positions of interest and (2) suggest activities the employee could complete to close the gaps. As one interview participant stated, the tool will provide employees and immediate supervisors with "a few ways to get where you want to go." In addition, an enterprise dashboard based on information collected by CMT will help second- and third-level supervisors identify training needs and gaps across the organization.

CMT will capture information on 24 competencies from multiple data sources, including

- personnel data systems
- employee self-assessments for technical skills and other kinds of skills
- games that measure behaviors, such as decisionmaking style, comfort with risk-taking, and concentration
- supervisor assessments.

The process will result in a unique report for each employee to aid career planning. For example, an employee with gaps in written communication skills might be asked to read self-study material or complete a certification. Interview participants reported that suggested interventions might also include earning a credential and that the tool will provide links to the virtual university site of Defense Acquisition University. Eventually, the tool could be adapted to functional areas outside contracting and provide employees with information about opportunities in these areas.

The CMT's ability to measure readiness deserves examination by the Army. The Army could examine its assessments and games for applicability to measuring readiness across the enterprise, although the data generated by games might reflect personal style more than objective readiness. In addition, the CMT's integration of personnel data systems, assessments, and behavioral metrics derived from games into personalized reports and supervisor dashboards could serve as a model for integrating other Army data sources on a larger scale. Similar to the RAC Tool, the CMT appears to involve a labor-intensive data collection pro-

¹⁴ Hawkins, 2021b.

¹⁵ DASA(P), "Career Mapping Tool Demo," briefing given to the authors, April 29, 2022, Not available to the general public.

cess, which might limit the potential for scaling up the tool. Overall, the CMT appears to be in an earlier stage of development than the RAC Tool, and we were unable to obtain details about data that will be captured by the tool and the ways they will be integrated. The Army should monitor the development and launch of the CMT as a possible model.

Science, Engineering, and Analysis Army Career Field Strategic Workforce Plan

Strategic workforce planning is “the systematic process for identifying and addressing gaps between the workforce of today and the human capital needs of tomorrow.”¹⁶ It helps an organization to identify future requirements (in terms of the number and skill set of personnel) and to develop a strategy for bridging any gaps that exist within the current workforce. The focus on reducing gaps between supply and demand suggests an inherent relationship to readiness; in fact, this process encompasses a variety of activities designed to support readiness.

The Army’s recent SEA Army Career Field Strategic Workforce Plan provides an example of this. The plan identifies gaps in personnel within the SEA workforce and gaps in their capabilities and skills that might affect the Army’s ability to conduct research and analytics to address future emerging threats, such as

- Increased demand for “personnel with data science and programming skills has . . . [caused] staffing gaps at the journeyman level.”
- There is “limited capability to test and evaluate in Army Priorities.”
- “Expertise for testing new technology does not exist.”¹⁷

The plan also identifies potential challenges resulting from the loss of skills because of retirement and an inability to recruit the most-qualified individuals because of competition from the private sector.

The SEA Army Career Field Strategic Workforce Plan goes on to propose strategies for bridging competency gaps to support the Army’s ability to continue research in priority areas and meet modernization efforts. These strategies include increasing recruitment efforts (e.g., targeted outreach to schools and organizations with STEM populations), decreasing the time to hire by using available hiring authorities, identifying training requirements for reskilling and upskilling, and providing necessary training opportunities. These strategies can be associated directly with *activities* identified in the logic model that support readiness goals; specifically hiring and staffing civilians and providing training support.

¹⁶ Defense Civilian Personnel Advisory Services, *Strategic Workforce Planning Guide*, May 2019.

¹⁷ U.S. Army, *Science, Engineering and Analysis Army Career Field Strategic Workforce Plan*, October 15, 2021, p. 3, Not available to the general public.

The plan also identifies goals for addressing competency gaps as well as activities and metrics to support achievement of those goals, although the metrics do not seem to have associated targets or benchmarks. For example, the report identifies a 22-percent gap in computer science personnel and states that the Army should reduce this gap to meet current and future mission requirements. However, the report does not specify by how much the gap should be reduced. Metrics to assess achievement of the goal include (1) the percentage decrease in the gap and (2) the time to hire computer science personnel, but there are no stated benchmarks to indicate acceptable reductions in either metric.¹⁸ Additionally, the identified gaps (e.g., 22 percent) suggest that the status quo (in supply) was compared against a target or benchmark. However, we were not able to ascertain what the target or benchmark was or how it was set. This might be worth additional investigation.

Although Strategic Workforce Planning does not assess readiness directly, the process supports the generation and maintenance of readiness. It can help an organization construct metrics to inform readiness assessments, identify current and future readiness gaps, and develop strategies to mitigate those gaps. Ultimately, strategic workforce planning could create a feedback loop from the end of the logic model to the beginning. Readiness assessment based on outcomes or outputs would inform strategic readiness planning, which would in turn inform inputs. This would generate new outcomes and outputs and a new readiness assessment.

Summary

The computation of readiness metrics requires the systematic collection of data on both workforce characteristics (supply) and workforce requirements (demand). Administrative data that can be used to describe the size, shape, and attributes of the current workforce are relatively plentiful and well understood, although some gaps persist (e.g., certifications, soft skills, and equipment). Data that capture requirements are both less plentiful and less reliable. Authorizations data cannot be matched easily with personnel data to compute readiness metrics, such as fill rate, and PDs are often incomplete or out of date. These deficiencies are the primary barrier to the development of valid civilian readiness metrics.

Several initiatives have endeavored to address some of these gaps for particular segments of the civilian workforce. DAWIA, which applies to the acquisition workforce only, mandates the collection of position-level data that include career field and certification requirements and can be matched with personnel data. The RAC Tool provides a platform for soliciting individual-level data on employee skills, both hard and soft, and position-level data on required skills and qualifications, but the data-collection process is labor-intensive. The CMT, which applies to the contracting workforce only, captures and integrates individual-level data on employee competencies from multiple data sources. However, aspects of the

¹⁸ U.S. Army, 2021, p. 21.

data-collection process (e.g., behavioral assessments) are labor-intensive. The Army should monitor these initiatives and extend their more-promising features to the larger civilian workforce to support the development and computation of readiness metrics.

Conclusions and Recommendations

The Army's civilian workforce plays a critical role in supporting the Army's mission. DoD and Army policies have focused attention on workforce planning, management issues, and more specifically on the contributions of the civilian workforce to strategic readiness. This has increased interest in the concept of civilian workforce readiness and how it might be measured. To ground workforce planning solidly in a concept of workforce readiness, the Army needs to specify a consensus-based definition of civilian readiness to apply across the Army and develop data resources that allow managers at different levels of the Army to assess the gaps between workforce requirements and workforce supply.

The Army Needs a Definition of Civilian Readiness

Our research revealed that the Army (and DoD more generally) lacks an articulated definition of civilian readiness. Our literature review, policy review, and interviews revealed some consensus on key features of such a definition: It should be grounded in requirements; support both a current and future-oriented perspective; and be applicable at the individual, functional and organizational, and enterprise levels. After synthesizing information from these sources, we proposed a working definition of civilian readiness that resonated with those we interviewed:

Civilian readiness can be defined as the state of having the right number of people with the right set of skills and competencies in the right job at the right time to support an Army capability.

This definition of civilian readiness can be applied at the individual, functional and organizational, and enterprise levels, and can be considered from a short-term and future-oriented perspective. The short-term perspective focuses on the question of whether the Army has the right workforce today to meet current needs. The future-oriented perspective focuses on whether the Army is poised to have the right workforce in the future to meet future needs.

This working definition informed our data collection and shaped our framework. It could serve as a starting point for the Army to specify a formal, codified definition of civilian readiness for use Army-wide. Just as there is a clear, codified definition of military readiness that is recognized DoD-wide, we recommend that the Army (and perhaps DoD as a whole) work

to build consensus on a definition of civilian readiness through formal processes that could create buy-in across the Army. Such consensus and buy-in is critical to some of the metrics development efforts we recommend later in this chapter. Currently, the understanding of what civilian readiness means is not consistent across the Army: A consensus-based definition is needed to fill that gap.

Therefore, we recommend that the Army establish, codify, and socialize its definition of civilian readiness and the implications for civilian readiness reporting and assessment. This would involve updating or creating a new Army Regulation, similar to the one for Army unit status reporting, in which key terminology is defined along with its context within the bigger strategic readiness picture, an authoritative system of record is designated, roles and responsibilities with respect to reporting and monitoring reports are established, and other business rules are defined. In several of these steps, an existing office or system may be able to take on a new responsibility or an entirely new entity might be required.

The Army Needs to Refine Its Processes for Specifying Current and Future Civilian Workforce Needs

The term *right* is central to the definition of readiness and points to the fact that readiness can only be understood by comparing the current characteristics of the Army workforce with some articulation of what is needed. We refer to that need as *workforce requirements*.

Organizational representatives (e.g., commanders) and career field managers (functional leads) have a role to play in ensuring that the specification of current workforce needs is accurate and up-to-date and makes sense from an individual, organizational, and functional perspective. Although organizational representatives tend to emphasize the short-term perspective and functional area leads tend to emphasize the longer-term perspective, their respective approaches to thinking about workforce requirements are complementary. Both organizational and functional leaders would benefit from efforts to collaboratively specify and document the key workforce requirements associated with current positions. Such collaborative efforts would contribute to more effective strategic workforce planning.

Strategic workforce planning rests on a clear understanding of current and future workforce needs and focuses on activities or processes that can meet those needs—in other words, activities (as described in the logic model) that support readiness.

Because Title 5 of the U.S. Code requires that civilians meet OPM-approved qualification standards for a position at the time they are hired,¹ some experts with whom we spoke questioned whether there could ever be a gap between official position requirements and civilian workforce characteristics. However, there are plenty of examples in which position requirements are described in terms of an ability to meet certain criteria within a time frame after assuming a position or to respond to the changing needs of the Army. Notably, individuals

¹ U.S. Code, Title 5, Government Organization and Employees.

hired into DAWIA-coded positions have a window for meeting position-specific certification requirements. Moreover, position requirements are not static. Because they evolve over time, incumbent workers who lack characteristics or skills associated with those new requirements generally are not removed from the position immediately. Indeed, several of our Army interviewees mentioned adaptability as a key aspect of civilian workforce readiness. Army leaders should focus on the opportunities to work within the parameters of Title 5 requirements to distinguish minimum qualifications from position requirements while uncovering the true barriers to conveying complete workforce expectations in PDs that may stem from Title 5.

The Army Needs to Improve Civilian Readiness Data Resources

Readiness metrics must be grounded in workforce requirements and capture the gaps between requirements and workforce supply. Articulating metrics that would characterize such gaps is a reasonably straightforward task. However, constructing usable measures requires data, systems, and approaches for analyzing the data and involves choices about the level at which to assess the gaps and prioritization.

Civilian Workforce Requirements Data Have Critical Limitations

Our research suggests that a fundamental barrier to the creation of robust, usable readiness metrics is a lack of systematic, usable data about civilian workforce requirements. The Army lacks a single source of information about civilian workforce requirements that speaks to the critical requirements associated with funded civilian positions and a common lexicon for describing them. Lacking such data, it is impossible to systematically analyze workforce gaps. The 2022 DBB report *Strengthening Defense Department Civilian Talent Management* suggests that this limitation is not unique to the Army: it recommends a DoD-wide “data lake with the department’s human resources personnel and manpower data based on functions and skills.”² Such a data resource would allow for the “automated comparison of manpower and personnel data to identify vacant billets, and the function of those billets, to drive the Department’s understanding of vacancy-based skills gaps.”³ Our interviews revealed that neither functional nor organizational managers have a common go-to source of information about current workforce needs. The Army needs a single authoritative source of information on workforce needs associated with a position and mechanisms to roll up that information by function, career field, and organization. Driving both organizational and functional leaders to a single source will increase the odds of buy-in for reporting and updating.

² DBB, 2022, p. 36.

³ DBB, 2022, p. 36.

Creating Data Resources and Specifying Responsibilities to Support Civilian Readiness Metrics

Developing a data source to support the development of readiness metrics would require coordinated effort across the Army. The Army is not starting from ground zero, but our research indicates that there are practical issues that hamper both the integrity of the administrative data (e.g., from FMSWeb or in PDs) as a bona fide reflection of substantive workforce needs and the integration of different information sources to provide a comprehensive picture of requirements. Our interviews suggest that managers across the Army—at different levels and from organizational and functional perspectives—would welcome and make active use of an authoritative source of information about requirements.

A collaborative effort to establish a single go-to source for information about civilian workforce requirements that can be linked to personnel data is needed. The DBB report alludes to a similar recommendation for DoD, suggesting that any Army effort might need to account for a related department-wide effort.⁴ DAWIA requirements (specifically, DoDI 5000.66) could serve as a model for an Army-wide framework for requirements-data collection that would involve the Civilian Human Resources Agency under the DASA(CP), and especially U.S. ACCMA career field managers, as well as commands, direct reporting units, and other organizational subunits. Army career field managers would take the lead in the detailed, functional work of developing, overseeing, and updating competency models, standard PDs, and common certification standards or credential requirements for their career field. Commanders and other organizational leads would draw on these standard PDs and credential or certification requirements when specifying requirements for specific positions.

A key action item is to identify a short list of data to be reported regularly to reflect workforce requirements. We advise the Army not to let the perfect be the enemy of the good. Start small, with essential requirements that would be easy to report and useful for both organizational and functional managers. Begin by reviewing the current requirements-related reporting specifications. Assess the quality of those data, reasons for quality shortfalls, opportunities to improve data quality, and opportunities to integrate or link data sources. We recommend that the Army strive to track all four aspects of readiness (fill, fit, equipment, and continuity) at both the individual and organizational and functional levels.

This review should be guided by a recognition that the quality of data reported is tied to accessibility and opportunities to use that data. In other words, managers have an incentive to accurately report information when the reporting burden is minimized and when they can make use of the information they report. To the extent that managers avoid updating administrative data because it is too much of a hassle, the Army must seek to understand the barriers to accurate reporting and identify ways to make data reporting valuable to managers.

ACCMA should take the lead in promoting the use of existing data sources and identifying new ones. For example, to expand use of FEVS data across the Army, ACCMA could

⁴ DBB, 2022.

develop recommendations for the analysis and use of FEVS data and develop comparative reports related to the readiness metrics outlined in Chapter 4. ACCMA could also advocate for Army interests in FEVS data access, survey methods, and survey content. ACCMA could further promote visibility about FEVS and other data resources by developing data analysis templates that organizational subunits could use to analyze the data, assess readiness, and support managers. ACCMA could also conduct Army-wide analyses to examine variation across the Army. ACCMA should also track data and tool-development efforts across the Army to leverage and promote alignment of data collection efforts, leveraging career field managers to the extent feasible.

The strategic importance of data is highlighted in the 2022 update to the Army's CIP, which includes a new crosscutting objective, "Leveraging Technology and Data."⁵ Key tasks under this objective call for the Army to create an inventory of data and technology resources related to civilian workforce management and the development of a data strategy. The recommendations outlined previously should be a key priority of any larger Army workforce data initiative.

Because of the advancements in natural language processing tools, a broader perspective is needed when thinking about potential data sources and how to use them. Regular updates to information being used on the ground can potentially serve as a data source about real-time workforce needs and capabilities. The ability to scrape information from operational artifacts, such as PDs, means that stand-alone readiness reporting systems may not be needed. Federal agencies like NASA are experimenting with artificial intelligence (AI) approaches to scraping information about workforce skills and capabilities from a variety of sources to improve understanding about readiness and workforce capabilities.⁶

Conclusion

Strategic workforce planning efforts involve ongoing assessments of anticipated workforce needs and the comparison of those needs with workforce supply. Operational workforce planning manages actual workforce readiness by tracking those ever-changing needs as influenced by unanticipated shifts to supply, demand, or both. To better ground both strategic and operational efforts in readiness metrics, the Army needs to foster consensus and collaboration between functional and operational leads by promulgating a definition of civilian workforce readiness and supporting the systematic collection of data about the workforce requirements that matter. Existing requirements do not shed light on meaningful aspects of what the Army needs from its civilian workforce. In this report, we direct the Army's attention to general metrics that speak to readiness. Data templates and reporting frameworks that are general

⁵ U.S. Army, 2022, p. 42.

⁶ David Meza, "Knowledge Graphs in People Analytics," video, Hyperight AB, August 17, 2022. We are grateful to our reviewer Dan Ward for pointing us to this description.

at the enterprise level and become increasingly specific at the functional and position levels would help guide readiness metrics development efforts. Which aspects of readiness metrics should be prioritized will vary by functional area and position and will change over time.

Methodology

In this appendix, we describe in more detail aspects of the methodological approach (outlined in the introduction) that are the core of our research and findings, including a review of the existing literature, stakeholder interviews and interview coding, logic model development, and the review of existing databases. In the closing section of this appendix, we present our approach to the selection of six occupational series that we used to narrow down the scope of our study.

Systematic Review of the Existing Literature

Our systematic review of the existing literature focused on academic, peer-reviewed, English-language articles on the readiness of government and private sector workforces that were published in scholarly journals from 2000 to 2021. We also consulted nonacademic open-source reporting that we identified as relevant and within the scope of our work, including Army, DoD, and other U.S. government organizations' policies and documentation, and previous RAND work on military readiness and key features of the civilian workforce, especially those relevant to the six occupational series we selected.

To identify relevant scholarly peer-reviewed articles, we searched seven databases: Academic Search Complete, Business Source Complete, Military Database, Public Affairs Information Service Index, Scopus, Social Sciences Abstracts, and Web of Science. Across the seven databases, we used several sets of search terms (which could be present anywhere in the record) that are listed in Table A.1. We initially cast a broad net for the searches (see searches 1 and 3); some of them resulted in a large number of abstracts to review (see search 1). For searches that resulted in over 500 abstracts, which we considered to be a reasonable cutoff number given our team's resources, we only scanned the abstracts to identify articles that could potentially be relevant to our project. For the searches that returned fewer than 500 abstracts, we reviewed all the abstracts. Using that review, we identified articles that seemed relevant to our project.

Findings from our literature review are presented in Appendix B.

TABLE A.1
Search Terms for Scholarly and Peer-Reviewed Articles

Search	Search Terms	Number of Abstracts	Status
1	“workforce readiness” OR “work force readiness”	584	Scanned abstracts
2	(“workforce readiness” OR “work force readiness”) AND civilian*	17	Reviewed abstracts and articles
3	(“workforce readiness” OR “work force readiness”) AND (definition OR metrics OR measures)	340	Reviewed abstracts and articles
4	(“workforce readiness” OR “work force readiness”) AND civilian* AND (definition OR metrics OR measures) AND civilian*	14	Reviewed abstracts and articles
5	(civilian* N20 (workforce OR “work force”)) AND (readiness N200 (report* OR assess* OR measur*)) (including Web of Science) ^a	236	Reviewed abstracts and articles
6	(“federal government” OR (defense N5 department) OR DOD OR pentagon OR army OR navy OR “air force” OR “intelligence community”) ^b	195	Reviewed abstracts and articles
7	(Cyber OR cybersecurity AND readiness) OR (Expeditionary AND civilian AND readiness)	172	Reviewed abstracts and articles
8	“workforce AND performance AND metrics”	83	Reviewed abstracts and articles
9	“workforce AND human capital AND pipelines”	3	Reviewed abstracts and articles
10	“institutional” OR “organizational” OR “individual personnel” AND “readiness”	1,842	Scanned abstracts
11	“institutional” AND “readiness”	570	Scanned abstracts
12	“organizational” AND “readiness”	1,340	Scanned abstracts
13	“individual personnel” AND “readiness”	2	Reviewed abstracts and articles
14	“business AND readiness”	953	Scanned abstracts
15	“ensur* AND workforce AND efficiency”	91	Reviewed abstracts and articles

NOTE: Web of Science does not allow proximity operators when searching the full record, so we used AND instead.

^a For Web of Science: (civilian* OR “civilian workforce” OR “civilian work force”) AND readiness AND (reporting OR assessment).

^b For Web of Science: (civilian* OR “civilian workforce” OR “civilian work force”) AND readiness AND (reporting OR assessment) AND (“federal government” OR “defense department” OR “department of defense” OR DOD OR pentagon OR army OR navy OR “air force” OR “intelligence community”).

Stakeholder Interviews and Interview Coding

We conducted 23 interviews with 32 stakeholder organizations, including various Army commands and organizations. Most of the individuals we interviewed belonged to various

DoD offices, the ACCMA, Army Sustainment Command (ASC) and AMC. For details on all the organizations and agencies to which the interviewees belonged, see Table A.2.

For the six occupational series we identified, we conducted interviews with representatives of the following entities (as appropriate):

- Army career program associated with the occupational series
- DoD and Army acquisition career field associated with the occupational series (if applicable)
- managers of key Army organizations employing individuals in the occupational series in question, including staff at specific functional or geographic combatant commands, where relevant
- managers of any relevant cross-cutting workforce group (e.g., cyber, military technician [MilTech], and expeditionary).

We selected our initial interviewees using our team members' professional networks and contacts from prior research as well as online searches of relevant agency and office websites. We also used the snowball sampling method, contacting stakeholders recommended by individuals in our initial sample.

TABLE A.2
Breakdown by Organization of the Interviews Conducted

Organization or Agency	Number of Interviews	Number of Interviewees
Department of Defense	5	6
Joint Staff J-1	1	1
Army HQDA	1	1
ACCMA	5	5
ACCMA and other agencies	1 ^a	3
AMC	2	4
ARCYBER	1	1
Army Acquisition Career Management Office	1	1
Army Defense Ammunition Center	1	1
Army Surface Deployment and Distribution Command	2	2
ASC	1	4
DASA(P) and Deloitte	1	2
Army G-1	1	1

NOTE: ARCYBER = U.S. Army Cyber Command; G-1 = Office of the Deputy Chief of Staff for Personnel; HQDA = Headquarters, U.S. Department of the Army; J-1 = Manpower and Personnel Directorate.

^a This interview included participants from several agencies: ACCMA, Army Installation Management Command, and the Army Medical Department Civilian Corps.

We developed a semistructured interview protocol focused on how civilian readiness is currently defined, individual and organizational readiness, how individual readiness relates to organizational readiness, and how this may vary by organization. The interview protocol is available in Appendix C.

We systematically coded the interview notes in an Excel spreadsheet using 11 coding categories and several subcategories and analyzed the coded data to glean relevant insights for this report.

Logic Model Development

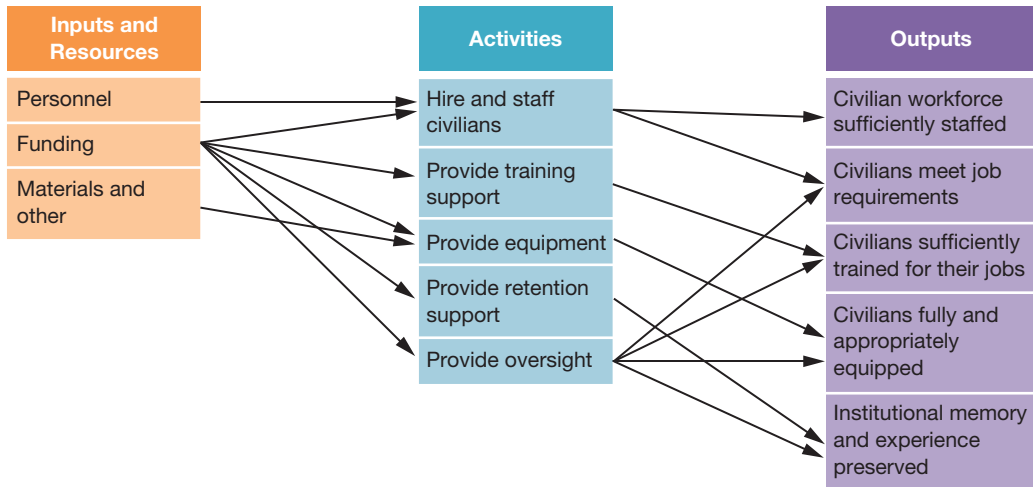
We leveraged a logic model in this research to help organize our findings about Army civilian workforce readiness and what structures and processes are necessary to become ready. The logic model also helped facilitate analysis of existing and proposed metrics related to Army civilian workforce readiness.

To develop the initial logic model, we used concepts from the literature review, interviews, and data assessment to formulate the appropriate categories of elements (i.e., policy, inputs and resources, activities, outputs, and outcomes) and the elements in each category. After receiving feedback from the sponsor, some adjustments were made to better reflect the types of activities that the Army civilian workforce performs and that align with the nested levels of readiness we developed at the time of this writing (see Chapter 2).

We made additional adjustments to orient the model to a workforce manager perspective—particularly with respect to language—because ultimately, the inputs to readiness tracking and the main audience for readiness metric will be workforce managers. For example, from an individual perspective, an example activity would be *receive training*, while from a managerial perspective, the corresponding activity would be *provide training support*.

Lastly, we ensured that the logic model was *connected*, meaning that each element within a category was related to both previous and following elements within the model. This ensured that each element within the model had meaning, that it was both influenced by some element in the immediately prior category, and that it influenced some other element in the immediately subsequent category. Figure A.1 depicts the relationships between elements of the Inputs and Resources and the Activities categories, as well as between the Activities and the Outputs categories.

FIGURE A.1
Logic Model Relationships



Review of Existing Personnel Databases

We reviewed several files maintained by the DMDC to identify potential sources of data that could inform the design of civilian workforce metrics.¹ Together, the DMDC files contain information on personnel, including their positions, assignments, ranks, pay, occupations, years of service, demographic characteristics, education, acquisition career fields, and acquisition certification levels. DMDC database records can be linked across files and over time in useful ways through a unique identifier (a scrambled Social Security number) that is used consistently across files and years for a given individual. By linking records across time and across files, we can examine movement into and out of the civilian workforce, movement between the DoD military and civilian workforces, as well as promotion and experience trajectories. These DMDC files include the following:

¹ For more information on the data files described here, please see the DoDIs that mandate the data reporting. Submission requirements for DoD civilian personnel are described in DoDI 1444.02, *Data Submission Requirements for DoD Civilian Personnel*, Vol. 1: *Appropriated Fund (APF) Civilians*, Office of the Under Secretary of Defense for Personnel and Readiness, 2013. Submission requirements for active-duty military personnel are described in DoDI 1336.05, *Automated Extract of Active Duty Military Personnel Records*, incorporating Change 3, Office of the Under Secretary of Defense for Personnel and Readiness, updated August 26, 2021. DoDI 1336.05 defines the Active Component (see paragraph 2b) by referencing DoDI 1120.11, *Programming and Accounting for Active Component (AC) Military Manpower*, Office of the Under Secretary of Defense for Personnel and Readiness, March 17, 2015. DoDI 5000.66 (2022) references two DoD guides that include the definitions and reporting requirements for the acquisition workforce covering the period of data used in this analysis. See DoD, *Defense Acquisition Workforce Data Reporting Standards Guide*, Under Secretary of Defense for Acquisition, Technology, and Logistics, July 20, 2017a; and DoD, *Defense Acquisition Workforce Program Desk Guide*, Under Secretary of Defense for Acquisition, Technology, and Logistics, July 20, 2017b.

- *Acquisition workforce person file and the acquisition workforce position file (DAWIA files)*. These files provide information on the individuals who are designated as part of the DAWIA workforce for FY 1992 onward, as well as the positions that DoD has designated as acquisition positions. The person file contains a record for each individual (both military and civilian) who was included in the service or agency submissions made in accordance with the *Defense Acquisition Workforce Data Reporting Standards Guide* (DoD, 2017a), referenced in DoD Instruction 5000.66 (2022). Each person record includes a DAWIA position code and can thus be linked to the position data.²
- *DoD civilian personnel inventory file*. The DoD civilian personnel file provides quarterly snapshots for all APF civilians³—including their grades, locations, education levels, and other demographic variables. The data begin in 1980 with annual observations taken as of September 30 (the end of DoD’s FY). From 2006 to March 2017, the snapshots are taken quarterly on September 30, December 31, March 31, and June 30. The data snapshot frequency changes to a monthly interval in April 2017. The data from this file also include information on an individual’s occupation, the organization they work in, pay plan, and years of service.
- *DoD civilian personnel transaction file*. The data from this file complement the inventory data by noting “transactions” that occur to workers between inventory snapshots. The transactions of central interest to us were indicators of and reasons for attrition (e.g., retirement, voluntary separation, or involuntary separation), as well as codes indicating whether an individual transferred to or from another federal government agency. We have obtained civilian inventory and transaction data going back to FY 1980 for this work.

We also analyzed data on civilian personnel using DoD-wide data from DMDC. We considered a variety of descriptive statistics, including measures of turnover, intra-agency transfer patterns, promotion patterns, and performance levels. While these statistics may be useful in supporting a measure of readiness, they do not directly measure readiness.

The DAWIA files provided the opportunity to examine the potential of using the position and person data to measure fill rates for the acquisition workforce. We also made a preliminary attempt to look at fill rates using the civilian files and the FMSWeb data. Though this

² As described in Gates et al., 2013, these DAWIA workforce data are available from 1992 to the present and are useful for analytical purposes. However, other methods of counting the acquisition workforce have been used over time. Alignment among these approaches occurred in FY 2005. See Susan M. Gates, Elizabeth Roth, Sinduja Srinivasan, and Lindsay Daugherty, *Analysis of the Department of Defense Acquisition Workforce: Update to Methods and Results Through FY 2011*, RAND Corporation, RR-110-OSD, 2013.

The DoD Inspector General has concluded that counts from FY 2004 and earlier are not verifiable. Because of these limitations to the workforce count information, readers are urged to use caution in interpreting trends related to the acquisition workforce prior to 2005. See DoD, Office of the Inspector General, *Human Capital: Report on the DoD Acquisition Workforce Count*, D-2006-073, 2006.

³ This includes seasonal and part-time employees.

comparison is theoretically possible, the systems are in no way designed to be integrated, and this would have only been a limited test case. Because of FMSWeb operational downtime, we were unable to complete the limited case comparison.

Selection of the Six Occupational Series

To explore some of the existing perspectives on or definitions of civilian workforce readiness, the functions served by Army civilians and the capabilities needed to perform those functions, we selected six occupational series: 0201 Human Resources, 0346 Logistics Management, 0610 Nurse, 1102 Contracting, 2210 Information Technology, and 5801 General Transportation upon which to focus our review. We selected these six occupational series using the following criteria:

1. *Congressional, DoD, or Army interests.* At least one of the selected occupational series falls into the following workforce categories because there is a strong policy interest in the STEM occupations (science, technology, engineering, and mathematics) and in MCOs across the federal government, DoD, and the Army:
 - a. Cyber as a workforce designation is not an occupational series in and of itself, although it is related to the GS-2210 IT occupational series, among others.
 - b. Acquisition
 - c. MCOs
 - d. STEM.
2. *Alignment with Army command.* At least one selected occupational series aligns well with a specific Army command (e.g., most individuals in that occupation are employed by a single command).
3. *Variance in the type of civilian work.* At least one selected occupational series comes from the Federal Wage System (FWS) to provide variance in the type of civilian work (white versus blue collar) explored in this project.
4. *Variance based on the deployability of civilian workforce.* At least one occupational series represents a job type for which expeditionary civilian demand has been substantial over the past 20 years.
5. *Variance based on the requirement that civilian workers be members of the National Guard or Reserves.* Military technician jobs are governed by Title 32 of the U.S. Code,⁴ and civilians hired into these positions are required to be guard or reserve members. At least one occupation includes MilTechs.
6. *Variance based on career program.* The selected occupations reflect a range of Army Career Programs.

⁴ U.S. Code, Title 32, National Guard.

As Table A.3 shows, we considered several occupational series, but we settled for the first six (highlighted in gray) because they touched on most (if not all) of the six criteria and because all of the selected occupations were in the top ten occupations ranked by number of Army civilians at the time when this analysis was conducted in spring 2022. The table reflects our team’s assessment of the degree of alignment between the occupational series and the workforce criteria above. STEM designation is based on the prevalence of STEM categorization for the occupational series. Prevalence assessment for the acquisition workforce reflected in this chart is based on the DoD Civilian Acquisition Workforce Personnel Demonstration Project (AcqDemo) pay plan, which does not capture all civilians in DAWIA positions.

Occupational series were used as a structuring principle because they are a key variable used to classify positions in the federal workforce and assign grade levels to positions. Once the occupational series were selected, we also looked at the workforce through other lenses, such as career programs that support professional development and oversight and organizational structures that support operations, readiness, and deployment.

TABLE A.3
Assessment Underpinning the Selection of the Six Occupational Series

Occupational Series Name and Number	Workforce Count as of June 2021	> 50 Percent in One Organization? ^a					
		Cyber	AcqDemo	MCO	STEM	FWS	MilTech
2210 IT Management	13,031	x	y	x	x		
1102 Contracting	6,321		x			x	
0610 Nursing	6,304			x	x	x	
0201 Human Resources Management	7,218		y	x			
0346 Logistics Management	8,535		y		y		
5801 General Transportation/ Mobile Equipment Maintenance	7,836						x x
0340 Program Management 0343 Management and Program Analysis	10,307		x		y		
0083 Law Enforcement	1,809			x		x	
0854 Computer Engineering 0855 Electronics Engineering	3,332	y	y		x		
0810 Civil Engineering	6,264		y		x		

NOTE: The rows highlighted in gray indicate the occupations we ended up selecting. An x indicates that all or most workers in this occupation meet the criterion; y indicates that some but not most workers in this occupation meet the criterion.

^a In this column, an x means that half or more than half of the Army’s workforce for that occupation series is assigned to one Army Command.

To explore existing perspectives on the definition of civilian readiness and the metrics that currently exist, but also those that are needed to measure readiness of the civilian workforce for these occupations, we reviewed open-source information and conducted interviews with stakeholders (see Appendix C on stakeholder interviews). The open-source information that we reviewed in relation to each of the six occupational series included OPM PDs, PDs from FMSWeb, job announcements, previous RAND reports, federal workforce gray literature, and the academic literature on how private sector organizations conceptualize readiness.

Key Insights from the Literature Review

This appendix describes the main streams of our literature review and some of our key insights that have relevance to defining and measuring civilian readiness. As mentioned in Appendix A on our methodological approach, we conducted a systematic review of the extant academic literature on the readiness of government and private sector workforces published in English from 2000 to 2021.¹ While some of the academic articles that we identified and reviewed touched on aspects of civilian workforce readiness in other U.S. government agencies outside the Army, most of the literature focused on industry or private sector organizations.

Defining Readiness

This section includes additional findings not previously discussed in Chapters 2 and 3 that informed our conceptualization and definition of civilian workforce readiness.

U.S. Government Approaches

Most approaches to workforce readiness that we encountered in our research were primarily focused on factors or methods that contribute to improving readiness rather than definitions or ways to conceptualize readiness. For instance, research regarding the Centers for Disease Control and Prevention (CDC) or CDC's Preparedness and Emergency Response Learning Centers (PERLCs) program aimed "to improve workforce readiness and competence through the development, delivery, and evaluation of targeted learning programs designed to meet specific requirements of state, tribal, and local partners."² In this vein, PERLCs advanced over 800 online webinars, in-person trainings, exercises, and other learning products that were "intended to improve public health workforce readiness and competence in emergency

¹ For more details on the methodological approach behind the systematic review of the literature, see Appendix A.

² Shoukat H. Qari, Mary R. Leinhos, Tracy N. Thomas, and Eric G. Carbone, "Overview of the Translation, Dissemination, and Implementation of Public Health Preparedness and Response Research and Training Initiative," *American Journal of Public Health*, Vol. 108, Supp. 5, November 2018, p. S355.

preparedness and response.”³ However, the article on CDC’s PERLCs does not include a definition of workforce readiness and only presents various alternatives to improving the readiness of a specific workforce segment.

Along similar lines, in an interview that Al Runnels, the Executive Director of American Society of Military Comptrollers, conducted with RADM Thomas Allan, the Assistant Commandant for Resources and chief financial officer for the U.S. Coast Guard, Admiral Allan identified some key elements that contribute to the readiness of the civilian workforce without directly or explicitly defining readiness:

We continue to push that readiness scenario, because we know that the workforce has a lot of different options. With the blended retirement system, and a talented civilian workforce that can move as they will, we’ve got to be the organization where people want to work, and that involves everything from pay, to how we’re training, to the technology provided for the workforce.⁴

We also aimed to identify how the civilian workforce in the six occupational series we selected (e.g., 0201 Human Resources, 0346 Logistics Management, 0610 Nursing, 1102 Contracting, 2210 IT Management, and 5801 General Transportation) defines or thinks about readiness. We encountered perspectives on workforce readiness in the cyber and medical career fields. Although these perspectives did not include explicit definitions of civilian readiness, they spoke to the factors that could contribute to readiness, including for civilian personnel. For instance, readiness for the Air Force’s cyber and space personnel rests on the entire workforce (both military and civilian) having “some level of foundational technical competence to be effective,”⁵ including “an informed understanding of emerging technical possibilities and a mentality of constantly looking ahead for new technological means that can change the ways we go to war.”⁶

In the medical field, both military and civilian personnel provide direct care in the Medical Health System (MHS): The main drivers for MHS workforce planning (a proxy for civilian readiness usually used in industry or the private sector) are “the requirements to provide war-time care and to provide health care for many active-duty personnel and dependents stationed in remote locations, for whom access to the civilian medical system would be difficult.”⁷ In this context, the article mentions some of the MHS workforce planning chal-

³ Qari et al., 2018, p. S355.

⁴ Al Runnels, “United States Coast Guard Financial Management Strategy and Operations,” *Armed Forces Comptroller*, Vol. 65, No. 2, Spring 2020, p. 7.

⁵ William T. Cooley and George M. Dougherty, “Every Airman and Guardian a Technologist: Reinvigorating a Disruptive Technology Culture,” *Air and Space Power Journal*, Vol. 35, No. 2, Summer 2021, p. 87.

⁶ Cooley and Dougherty, 2021, p. 87.

⁷ Benjamin F. Mundell, Mark W. Friedberg, Christine Eibner, and William C. Mundell, “US Military Primary Care: Problems, Solutions, And Implications for Civilian Medicine,” *Health Affairs*, Vol. 32, No. 11, November 2013, p. 1950.

lenges that partly result from the need “to train for and provide care related to military missions (including combat care, humanitarian care, and disaster intervention) that has limited overlap with peacetime health care.”⁸

Private Sector Approaches

In private sector organizations, two proxies for workforce readiness are workforce planning and work readiness. *Workforce planning* is defined as having the “right number of people with the right set of skills and competencies in the right job at the right time,”⁹ while *work readiness* addresses the extent to which “individuals have attitudes, skills, and knowledge that can help them prepare for success at work,”¹⁰ including the individual’s ability to work independently and “to adjust to the cultural demands at work.”¹¹ Across both government and private sector approaches to readiness, we encountered a common conceptualization of readiness as focused on the individual and the organization, but the private sector literature provided more in-depth insights into individual and organizational readiness as presented in the following subsections.

Individual Readiness

Research on individual readiness has roots in learning psychology and often focuses on two aspects: (1) the individual’s motivation or resolve and (2) the individual’s readiness to enter the workforce. In this light, individual readiness can “refer to a person’s resolve to stop smoking,”¹² but also their motivation and availability of skills that allows them to enroll in college or in online programs; to accept, embrace, or implement change in the workplace; to learn certain principles or concepts and expand their professional role at work; to adopt or implement technology or specific organizational practices; and to be *technologically ready* to perform a certain work task.¹³

Organizational Readiness

The existing literature on organizational readiness that we reviewed revolves around two concepts: *organizational readiness* and *institutional readiness*, which are often encountered in the public health and organizational change literature. Similar to individual readiness, some research uses readiness at the organizational level as a proxy concept or term for *motivation*.

⁸ Mundell et al., 2013, p. 1951.

⁹ Gates et al., 2006, p. 85.

¹⁰ Tentama and Riskiyana, 2020, p. 827.

¹¹ Tentama and Riskiyana, 2020, p. 827.

¹² Dearing, 2018, p. 1.

¹³ Todd J. B. Blayone and Roland VanOostveen, “Prepared for Work in Industry 4.0? Modelling the Target Activity System and Five Dimensions of Worker Readiness,” *International Journal of Computer Integrated Manufacturing*, Vol. 34, No. 1, 2021.

In this light, organizational readiness is mainly used in the literature when an organization adopts or implements change and is defined as “the extent to which organizational members are psychologically and behaviorally prepared to implement organizational change.”¹⁴ Organizational readiness can also refer to the organization’s “members’ shared resolve to implement a change (change commitment) and shared belief in their collective capability to do so (change efficacy).”¹⁵

Institutional readiness is usually focused on organizational level change and technology adoption and is defined as the institutional domain or milieu and “its practices, routines, resources and values,” where new approaches or technologies are being “developed, enabled, embraced, marginalized or side-lined.”¹⁶

In the literature that focuses on organizational level change or technology adoption, the concepts of *readiness* and *maturity* are often used interchangeably, even though some studies distinguish between preparation for the initial implementation phase (or the readiness of the organization to embark on the change process or adopt a certain technology) and the subsequent developmental phase (maturity).¹⁷

Organizational readiness can therefore refer to an organization’s members’ motivation and ability to adopt and implement change, innovation, new IT or information systems, tax or other type of reform; to have the assets needed and right processes in place; to improve customer interaction; to provide better services to citizens or customers; to improve performance; and, for healthcare organizations, to assume financial risk for care delivery.

Factors That Contribute to Civilian Readiness

Following the presentation of some of the main approaches in the extant literature related to how the U.S. government and the private sector define and conceptualize workforce readiness, in this section we present some of the key factors we identified in the literature that potentially contribute to civilian readiness. While some are more broadly relevant to the civilian workforce, others pertain to a specific segment of the workforce or occupation, such

¹⁴ Bryan J. Weiner, Halle Amick, and Shou-Yih Daniel Lee, “Conceptualization and Measurement of Organizational Readiness for Change: A Review of the Literature in Health Services Research and Other Fields,” *Medical Care Research and Review*, Vol. 65, No. 4, August 2008, p. 381.

¹⁵ Weiner, 2009, p. 1.

¹⁶ Andrew Webster and John Gardner, “Aligning Technology and Institutional Readiness: The Adoption of Innovation,” *Technology Analysis and Strategic Management*, Vol. 31, No. 10, 2019, p. 1232.

¹⁷ Kartal Yagiz Akdil, Alp Ustundag, and Emre Cevikcan, “Maturity and Readiness Model for Industry 4.0 Strategy,” in Alp Ustundag and Emre Cevikcan, eds., *Industry 4.0: Managing the Digital Transformation*, Springer International, 2018; Anthon P. Botha, “Rapidly Arriving Futures: Future Readiness for Industry 4.0,” *South African Journal of Industrial Engineering*, Vol. 29, No. 3, 2018; Blayone and VanOostveen, 2021, p. 2.

as nurses or cyber professionals. As the information presented in this section shows, these factors focus on readiness at the individual and organizational level.

At the Individual Level

Key individual-level factors that contribute to civilian readiness include the following:

- *Physical and mental health*: Employees are healthy and fit to carry out their missions, and overall, the workforce is medically ready, which means “free of health-related conditions that impede the ability to participate fully in operations and achieve mission goals.”¹⁸ This aspect is also referred to as “medical readiness”¹⁹ and can be conceptualized or considered as a subcomponent of individual readiness. Along with physical health, mental health and stress management are important aspects of readiness for first responders, expeditionary or deployable personnel, and medical workers.²⁰ For women, medical readiness also includes a reproductive health aspect, especially for those who deploy with reproductive health being “directly tied to the medical readiness of female service members.”²¹
- *Cognitive abilities*: Human cognition represents a vital aspect of an individual’s ability to be effective when carrying out complex operations,²² and cognitive readiness represents “the mental preparation—the skills, knowledge, abilities, and motivations—an individual needs to establish and sustain competent performance in the complex and unpredictable environment of time-critical operations.”²³ Similar to medical readiness, cognitive readiness can be conceptualized as another subcomponent of individual readiness. Within cognitive readiness, competency and ability (which refers to the individual’s ability to perform a task and to cope with changing environments) need to be considered jointly “because no single attribute is sufficient in isolation. For instance, a particu-

¹⁸ IOM, 2014, p. 2.

¹⁹ IOM, 2014, p. 2.

²⁰ IOM, 2014; “Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us,” 2016; Matthew Heric and Jenn Carter, “Cognitive Readiness Assessment and Reporting: An Open Source Mobile Framework for Operational Decision Support and Performance Improvement,” *Performance Improvement*, Vol. 50, No. 7, August 2011, p. 6; Jon R. Wallace, “Field Test of a Peer Support Pilot Project Serving Federal Employees Deployed to a Major Disaster,” *Social Work and Christianity*, Vol. 43, No. 1, Spring 2016.

²¹ Ryan J. Heitmann, Crystal B. Hammons, and Alison L. Batig, “Women’s Health Knowledge and Skills Among Transitional Year Internship-Trained Military Medical Officers Serving as Independent Health Care Providers,” *Military Medicine*, Vol. 182, No. 7, July–August 2017, p. e1813.

²² Nancy J. Wesensten, Gregory Belenky, and Thomas J. Balkin, “Cognitive Readiness in Network-Centric Operations,” *US Army War College Quarterly: Parameters*, Vol. 35, No. 1, Spring 2005.

²³ Heric and Carter, August 2011, p. 6; John E. Morrison and J. D. Fletcher, *Cognitive Readiness*, Institute for Defense Analyses, 2002.

larly noteworthy performer may be inflexible and not have the abilities to manage in volatile situations, while a compliant individual may acclimatize quickly to operational variants but lack abilities to link basic operating procedures to proper reactions.”²⁴

At the Organizational Level

Key organizational-level factors that contribute to civilian readiness include the following:

- *Requiring certifications and accreditation for prospective and current employees, and having high educational standards for hiring and a pay scale in place:* Within an organization, these elements are expected to encourage individual employees to pursue additional training and discourage high turnover among the workforce.²⁵
- *Having targeted training programs in place:* Such programs are designed to meet specific organizational requirements and contribute to improving workforce readiness.²⁶
- *Requiring advanced education:* On the one hand, for very technical occupations, such as cybersecurity requiring current or prospective employees to pursue advanced education opportunities enhances workforce readiness;²⁷ on the other hand, the long training time can hinder readiness in the short term, while existing employees take leave from their jobs to upgrade their skills.²⁸
- *Providing competitive pay and compensation:* Pay and compensation are two factors related to an organization’s ability to recruit and retain its workforce that, in turn, have an impact on the number of personnel available.²⁹
- *Having external partnerships:* Partnerships with state, tribal, and local entities and non-profit organizations, for example, play an important role in building up the capabilities and capacity of an organization.³⁰ Organizations can make up for potential shortages in

²⁴ Heric and Carter, 2011, pp. 6–7; J. D. Fletcher, *Cognitive Readiness: Preparing for the Unexpected*, Institute for Defense Analyses, IDA Document D-3061, September 2004.

²⁵ Latosha Floyd and Deborah A. Phillips, “Child Care and Other Support Programs,” *Future of Children*, Vol. 23, No. 2, Fall 2013.

²⁶ Qari et al., 2018.

²⁷ Albert Harris III, “Preparing for Multidomain Warfare: Lessons from Space/Cyber Operations,” *Air and Space Power Journal*, Vol. 32, No. 3, Fall 2018, p. 52.

²⁸ Shirley M. Ross, Irina A. Chindea, John S. Crown, Samantha E. DiNicola, Ginger Groeber, Lawrence M. Hanser, Jennifer J. Li, *Preparing Space Warfighters for a Contested, Degraded, and Operationally Limited Environment: Considerations Regarding Space Force General Officers, Career Field Sustainability, Training Pipelines, and the Civilian Workforce*, RAND Corporation, forthcoming.

²⁹ Ginger Groeber, Kirsten M. Keller, Philip Armour, Samantha E. DiNicola, Irina A. Chindea, Brandon Crosby, Ellen E. Tunstall, and Shreyas Bharadwaj, *Department of the Air Force Civilian Compensation and Benefits: How Five Mission Critical and Hard-to-Fill Occupations Compare to the Private Sector and Key Federal Agencies*, RAND Corporation, RR-A334-1, 2021; Runnels, 2020; Mundell et al., 2013.

³⁰ Qari et al., 2018.

specific skillsets or in the number of employees to maintain in the organization's readiness through these external partnerships.

For civilian medical personnel, including nurses, some individual- and organizational-level factors with impact on the readiness of the organization in times of crisis came up in our review of the literature as follows:

- *Individual-level factors—nurses' availability and ability to report to work:* Because some medical personnel can become both victims and responders in times of crisis, there are concerns regarding their availability and ability to report to work and their willingness to work extra hours during an emergency or disaster.³¹
- *Organizational-level factors—advance planning and communication:* For those nurses who are willing to come to work during the crisis, it is important for the organization's management to plan in advance for communication and transportation to support these nurses to ensure the readiness of the organization.³²
- *Organizational-level factors—training on how to handle victims during crises:* For the nurses who are responders in times of crisis, receiving prior training on how to handle victims (especially in situations that involve bioterrorism, for example) increases their ability to effectively respond to the situation at hand.³³

Approaches to Measuring Workforce Readiness

Approaches to measuring workforce readiness are difficult to generalize because of the different conceptualizations of the terms *workforce* and *readiness*, the presence of often incomplete or flawed workforce analytics, and difficulties in operationalizing readiness and some of the key factors that make up workforce readiness—which meant that there was limited literature discussing this topic. For instance, cognitive flexibility is operationalized in various ways, such as “motivation to learn” and “openness to change,”³⁴ while *employee competence*—an element contributing to workforce readiness—is not “fixed or static” and varies with the workplace and the environment in which the organization operates, the employees' willing-

³¹ Andrea M. Morris, Karen A. Ricci, Anne R. Griffin, Kevin C. Heslin, and Aram Dobalian, “Personal and Professional Challenges Confronted by Hospital Staff Following Hurricane Sandy: A Qualitative Assessment of Management Perspectives,” *BMC Emergency Medicine*, Vol. 16, 2016, p. 2; Paula A. Stangeland, “Disaster Nursing: A Retrospective Review,” *Critical Care Nursing Clinics of North America*, Vol. 22, No. 4, December 2010, p. 428; Christine D. Valdez and Thomas W. Nichols, “Motivating Healthcare Workers to Work During a Crisis: A Literature Review,” *Journal of Management Policy and Practice*, Vol. 14, No. 4, January 2013, p. 48.

³² Morris et al., 2016, p. 2; Stangeland, 2010, p. 428; Valdez and Nichols, 2013, p. 48.

³³ Stangeland, 2010, p. 428; Valdez and Nichols, 2013, p. 48.

³⁴ Blayone and VanOostveen, 2021.

ness to deploy their competence towards achieving the organization's goals, and the employer's ability to engage the employees to maximize the level of competence they dispense.³⁵

The approaches that are present in the literature focus on "a closer examination of the integral parts that contribute to an organization's ability to effectively prepare for, respond to and recover from a disruption"³⁶ and are often related to a specific type of readiness (i.e., cognitive readiness, medical readiness). They often focus on identifying and measuring factors that enable "successful human functioning within a target context,"³⁷ which include technical, methodological, social, and personal abilities, or what is known as knowledge, skills, attitudes.³⁸

For example, while the importance of evaluating or measuring the cognitive readiness of individuals and teams is acknowledged to contribute to effective and accurate assessments of mission readiness and allow managers or supervisors to improve their assessment, monitoring, and mitigation of factors connected to suboptimal individual performance, historically cognitive readiness metrics have been difficult to employ.³⁹

Another example concerns the assessment, promotion, and sustainment of medical readiness of DHS personnel. In this vein, a 2014 IOM committee assessment recommended that DHS develop a common framework that assesses "an individual's capacity for achieving mission readiness both before and during employment with DHS."⁴⁰ Such a framework was expected to identify and mitigate the "physical and mental limitations on an individual's ability to carry out the responsibilities of his or her position."⁴¹

To conclude, despite the importance of measuring the readiness of the workforce (or various aspects of said readiness such as cognitive or medical readiness), few private sector and government organizations seem to be able to successfully identify, operationalize, and employ metrics that evaluate readiness at both individual and organizational level.

³⁵ Hester Nienaber and Nisha Sewdass, "A Reflection and Integration of Workforce Conceptualisations and Measurements for Competitive Advantage," *Journal of Intelligence Studies in Business*, Vol. 6, No. 1, May 2016; Christopher A. Bartlett and Sumantra Ghoshal, "Building Competitive Advantage with People," *MIT Sloan Management Review*, Vol. 43, No. 2, January 15, 2002; Benjamin A. Campbell, Russell Coff, and David Kryscynski, "Rethinking Sustained Competitive Advantage from Human Capital," *Academy of Management Review*, Vol. 37, No. 3, July 2012.

³⁶ Strong, 2010, p. 363.

³⁷ Blayone and VanOostveen, 2021, p. 2.

³⁸ Blayone and VanOostveen, 2021, p. 2.

³⁹ Heric and Carter, 2011; Morrison and Fletcher, 2002.

⁴⁰ "Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us," 2016, p. 94; IOM, 2014.

⁴¹ "Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us," 2016, p. 94; IOM, 2014.

Interview Protocol

The authors used the following protocol for all the interviews carried out for this project from February to April 2022. It is reproduced verbatim.

Background

The Office of the Assistant Secretary of the Army (Manpower & Reserve Affairs), U.S. Department of the Army has sponsored a RAND Corporation study that seeks to develop metrics for assessing readiness levels of the Army civilian workforce. Although numerous studies have researched the readiness of military units, none have defined civilian readiness or proposed metrics for assessing the civilian readiness level. The metrics developed during this project will directly inform policies and practices relating to the sizing and management of the Army civilian workforce.

To assist in RAND's research effort, RAND is interviewing key stakeholders in six key occupational series spanning the spectrum of the Army civilian workforce and government officials with experience implementing civilian readiness-related policies as well as human resource experts from academia and the private sector with an understanding of workforce readiness and how to measure it across various types of organizations. We are interested in your perspective because of your professional experience in these areas. In particular, we seek to map out the functions served by Army civilians in these key occupations and capabilities necessary for performing those functions, perspectives on current and potential readiness of the Army civilian workforce both within the chosen occupations and as a whole, and perspectives on gaps that must be filled to achieve peak Army civilian readiness in the chosen occupations and across the entire Army civilian enterprise. Our questions will focus on occupation-specific issues and broader readiness-related questions, including readiness metrics.

Please note that this is an unclassified discussion. Do not discuss classified information in your responses. If you would like to have a classified follow-up discussion with us on a topic, just let us know and we can arrange it.

Voluntary Participation

All participation is voluntary. You can decline to participate, or you can decline to answer any questions you prefer not to answer. If at any time you do not want to answer a question or would like to stop the discussion, please let us know. There are no penalties for doing so.

Confidentiality

We will take notes during the discussion to have a record of what was discussed. These interview efforts are for background information and/or to inform our analysis. We will keep your information confidential, which means we will not identify you by name or by your specific title within the organization nor attribute select comments to individuals. However, we will acknowledge that we spoke with categories of people, and in our reporting, we will attribute your quotes either to your organization or to your job position (e.g., “a senior Army official told us...”). While we believe the risks of participation are minimal, it is theoretically possible that even without attribution, someone could infer your participation in this study.

If there are specific remarks that you would like us to keep confidential, please let us know, and we will be sure they stay off the record – we will not record them in our notes.

Readiness Definition

This is our working definition of civilian readiness that we wanted to share to give you some insight into what we’re thinking, but we’re very open to whether or not this is the right way to conceptualize civilian readiness.

“The Army defines readiness as the ability of U.S. military forces to fight and meet the demands of the National Military Strategy. For Army civilians, we conceptualize readiness as both the capability of civilians to support Army missions as well as the state of having the right number of people with the right set of skills and competencies in the right job at the right time. The former conceptualization aligns with assessments of military operational readiness, and the latter corresponds with workforce planning – both of which are important considerations for the Army civilian workforce.”

Interview Questions

Perspectives on Defining Civilian Readiness

1. How do you think about readiness specifically for the civilian workforce (if at all)?
 - a. What are key differences and/or similarities we should consider between civilian readiness and military readiness?

2. What primary inputs do you factor into your definition (or understanding) of civilian workforce readiness?
 - a. At what level do you consider inputs? (Individual level? Organizational level? Functional level? Others?)
3. Do readiness requirements change under certain circumstances (e.g., national emergencies, disasters, contingencies, etc.)?
 - a. If so, how do these requirements change? Are there additional requirements or performance criteria necessary to be successful/considered ready?
 - b. Are these additional requirements/criteria regularly assessed as part of day-to-day readiness?
4. What qualities/characteristics are necessary for an individual to successfully perform his or her job? And what qualities/characteristics are necessary for the unit/team to successfully perform its mission?
 - a. How do individual requirements differ from those of the unit/team as a whole? How do they support the unit/team mission?
 - b. Are these qualities and characteristics adequately reflected in position descriptions?
 - c. Does your response to the latter question vary by position (e.g., do some positions, occupations, or workforce segments have better position description PDs than others? If so, how?)
 - d. How do you assess whether an individual, or the unit/team as a whole, is prepared to successfully perform a job/mission?
5. From your perspective, are there particular segments of the civilian workforce or occupations for which there are good definitions and measures of readiness?

Issues Experienced with Civilian Readiness

6. What are the main civilian workforce readiness-related issues currently experienced by:
 - a. Your office/organization?
 - b. The Army (in part or as a whole)?
7. Can you describe a situation in which it seemed that readiness fell short?
 - a. What were the implications of this shortfall and how did you address the implications (i.e., What aspects of the mission were affected)? How did you identify shortfalls (what metrics or indicators highlighted the issue)? What strategies, such as assigning the work to military personnel, hiring contractors, delaying the work, etc., did you use to address the shortfall?

- b. What were the contributing factors (i.e., why do you think that readiness fell short of necessary requirements)? [Probe on individual vs. organizational]
- c. In hindsight, do you think the shortfalls could have been mitigated or prevented entirely with better information about workforce readiness? If so, what information would have been valuable and how would it have been used?
- d. Were there any recent changes to policy, procedure, or practice as a result of these experiences?

Measuring Civilian Readiness

8. What aspects of civilian readiness are most important to meeting your organizational mission? How do you assess those aspects of civilian readiness? What management or operational decisions are informed by those readiness assessments?
9. What elements of existing Army or Joint/DoD readiness metrics are the most useful in assessing the readiness of civilians under your purview (in accordance with your working definition of readiness)?
 - a. To what extent do you have access to information that allows you to assess civilian workforce readiness?
 - b. What additional information would allow you to better assess civilian workforce readiness?
 - c. What are the challenges associated with obtaining that information?
10. What are some of your top recommendations regarding future improvements to readiness metrics in general, and to civilian workforce readiness metrics specifically?
 - a. Do these recommendations differ when applied to the individual, organizational, or functional levels?
11. Are there specific readiness metrics that are most useful in informing management or operational decisions in your office/organization?
 - a. Are these generic readiness metrics or civilian workforce readiness metrics?
 - b. Why do you find them useful?
 - c. Along similar lines, which are the least useful metrics for decisions, and which are the reasons why you do not find them useful?
 - d. Are there qualities/characteristics/metrics that you believe are important but are not currently tracked or assessed?
12. To what extent do you have access to data or metrics that allow you to assess whether an individual civilian employee, or the civilian workforce as a whole, have the qualities and characteristics necessary for either individual or organizational success?

13. Are there any readiness-related issues we have not covered that we need to know about?

Key Occupation-Specific Questions (for Interviewees or Supervising Workers in Selected Occupations Only)

We are exploring 6 occupation-specific case studies in this research: IT Management (2210), Nursing (0610), Contracting (1102), Logistics Management (346), Human Resources (0201), General Transportation/Mobile Equipment Maintenance (5801). The following questions pertain specifically to your experience in, or knowledge of, one of these occupations and/or a tangential occupation.

1. Please discuss how your occupation contributes to the mission of the Army.
 - a. What skills and capabilities do civilians need to perform critical functions in your occupation?
 - i. Are there specific credentials/certifications that civilians need to obtain and maintain while serving in this occupation?
 - b. Are there resources (e.g., equipment, training) that you or the civilians under your supervision need to perform those functions?
2. What does readiness mean when applied to [Occupation]?
3. Are there any metrics you use when assessing civilian readiness in your occupation?
 - a. If yes, what are the respective metrics and how useful do you find them?
 - b. Conversely, what metrics do you think would be useful or should be used (in the absence of existing readiness metrics)? Why do you believe they are useful? How would they be used?
 - c. Are there any authorities- or policy-related changes that would be needed to implement these metrics?
 - d. What kind of additional information would be useful to have when developing metrics to assess readiness?
 - e. In considering how often to measure civilian readiness metrics, are these metrics relatively static? If not, how often do they change? Have you identified what may cause change, particularly when change is drastic?
4. On a continuum from 1 to 5 (1 being very ready to 5 being the least ready), how would you assess the overall readiness of your occupation?
 - a. Are there specific gaps you have identified that are a hindrance to readiness? If so, where do you report them so that they may be addressed?
5. Are there any issues related to readiness and your occupation that we have not asked about and should have asked?

Key Workforce Segment–Specific Questions (for Interviewees or Supervising Workers in Workforce Segments Related to Key Occupations Only)

In addition to occupation-specific case studies, we are exploring several “workforce segments” pertinent to the Army civilian workforce in this research: cyber, acquisition, military critical occupations, STEM, MilTechs, and FWS. The following questions pertain specifically to your experience in, or knowledge of, one or several of these workforce segments.

1. Please discuss how your workforce segment contributes to the mission of the Army.
 - a. What functions do civilians in your workforce segment serve?
 - b. What knowledge, skills, abilities or dispositions do they need to perform those functions?
 - c. Who is responsible for determining the required knowledge, skills, abilities or dispositions?
 - d. Does the workforce require resources (e.g., equipment, training) to perform those functions?
 - e. How does [relevant occupation(s)] align with your workforce segment?
2. How do you think of readiness as it pertains to your workforce segment?
3. Are there any metrics you use when assessing civilian readiness in your workforce segment?
 - a. If yes, what are the respective metrics and how useful do you find them?
 - b. Conversely, what metrics do you think would be useful or should be used (in the absence of or in addition to existing readiness metrics)? Why do you believe they are useful? How would they be used?
 - c. Are there any authorities- or policy-related changes that would be needed to implement these metrics?
 - d. What kind of additional information would be useful to have when developing metrics to assess readiness?
4. On a continuum from 1 to 5 (1 being very ready to 5 being the least ready), how would you assess the overall readiness of your workforce segment?
 - a. Are there specific gaps you have identified that are a hindrance to readiness? If so, where do you report them so that they may be addressed?
5. How does the readiness of [occupation name or names] fit with your conception of readiness of your workforce segment?
6. Are there any issues related to readiness of your occupation that we have not asked about and should have asked?

Federal Employee Viewpoint Survey

FEVS collects information about the work experience and work-related satisfaction of federal civilian employees. It includes core questions about the work unit and broader organization; immediate supervisors and agency leadership; specific aspects of workplace experience, such as training, workload, and input into workplace decisions; and satisfaction with multiple aspects of work. In addition, FEVS includes questions about employee demographics and timely topics, such as the partial government shutdown and the coronavirus disease 2019 (COVID-19) pandemic.¹ FEVS is administered to permanently employed, nonpolitical, nonseasonal, full- or part-time employees of executive branch agencies.² OPM began administering FEVS once every two years in 2002 and every year beginning in 2010.³ In 2012 and from 2018 to 2020, all eligible employees in participating agencies were invited to complete the survey.⁴

The content and administration of FEVS changed substantially during 2019–2020 and 2021 because of the COVID-19 pandemic. Many core items were removed from the survey, reducing the number of core items from 102 to 71, and questions related to the COVID-19 pandemic were added.⁵ The survey period was shifted from spring to fall, and the 2021 survey was administered as a census among the ten largest agencies and as a sample among other agencies.⁶ In 2022, the survey period will shift back to spring and the number of core items

¹ OPM, “Federal Employee Viewpoint Survey: Technical Report,” webpage, undated-c; OPM, *Federal Employee Viewpoint Survey Results: Governmentwide Management Report*, 2021a.

² In the 2021 FEVS, agency leaders were allowed to opt in temporary employees not previously eligible to participate. See OPM, undated; OPM, 2021a.

³ OPM, “Federal Employee Viewpoint Survey: About,” webpage, undated-a.

⁴ In 2011, the FEVS was administered as a census to 13 larger agencies and most small or independent agencies. In 2013–2017, FEVS was administered to a sample of eligible employees. See OPM, 2011; and OPM, *Federal Employee Viewpoint Survey: Technical Report*, 2017.

⁵ OPM, undated-c.

⁶ OPM, 2021a.

will remain approximately the same at 70 items.⁷ An Army official stated that the 2022 survey will be offered to all eligible employees in the May–June time frame.⁸

Federal agencies and the public can access FEVS results in several ways. OPM publishes static reports that present aggregated responses across each agency and for all federal agencies combined. For the DoD, the reports present aggregated responses for each military service and fourth estate agencies.⁹ OPM also publishes public use data files that contain responses from each employee for each item. Employee records are anonymized and exclude most demographic information so that employees cannot be re-identified. Before 2020, the public use data files included a Level 1 agency code so that results could be aggregated by major sub-agencies within each agency. For the Army, examples of Level 1 subagencies include Army Cyber Command, the U.S. Army Acquisition Support Center, and Army Human Resources Command.¹⁰ Beginning in 2020, OPM removed Level 1 codes from the public use data files. Currently, OPM does not plan to include Level 1 codes or more granular subagency codes in future public use file.

OPM provides federal agencies with access to FEVS results disaggregated to more granular levels through the FEVS Online Analysis and Reporting Tool. This online portal is operated by Westat, the primary contractor for the survey. Work units within federal agencies can be disaggregated up to nine levels below the agency level.¹¹ To define the organizational components whose results are available through the portal, each agency submits an organizational map laying out the precise hierarchy of the agency, and OPM uses the map to identify the levels within the agency. This means that federal agencies potentially can monitor information captured by FEVS for very specific work units. At least one participant we interviewed indicated that the participant’s organizational component uses FEVS items to create metrics and monitor these metrics for specific locations.

Information from FEVS could be used to help monitor Army civilian readiness. Because FEVS captures factors that affect organizational performance,¹² all FEVS items could plausibly be related to readiness. To help the Army use FEVS for readiness measurement in combination with key metrics from other data sources, we identified a select set of FEVS items directly related to readiness (see Table D.1). We used the following process to identify the metrics:

⁷ OPM, 2022.

⁸ Jon Micheal Connor, “FEVS Provides Avenue to Leadership, Drives Workplace Change,” U.S. Army, November 16, 2021.

⁹ OPM, *Office of Personnel Management Federal Employee Viewpoint Survey: Report by Agency*, 2021b.

¹⁰ OPM, “Federal Employee Viewpoint Survey: Public Data Files,” webpage, undated-b.

¹¹ OPM, undated-c.

¹² OPM, undated-c.

- We considered the 70 core items that will be administered to employees in spring 2022.
- We examined the alignment between each item and elements under the activities, outputs, and outcomes levels of the logic model. We did not include the inputs level in this step because such inputs as funding levels may not be readily visible to employees. In contrast, activities that require inputs and the outputs that they produce will be experienced directly by employees. In addition, employees likely will have valuable perspectives on the extent to which individuals and subagencies within the Army achieve big picture goals that correspond to readiness outcomes.
- We coded each item as (1) well aligned with one or more elements of the logic model or (2) unaligned and only indirectly related to readiness.
- After coding each item, we narrowed the set of aligned items. Specifically, we identified at least one item to represent each element under activities, outputs, and outcomes. We considered the items holistically and attempted to create a concise and balanced set. In some cases, the match between FEVS items and logic model elements was approximate. For example, even though the item represents an output rather than an activity, we matched the 2022 FEVS item, “My workload is reasonable,” with the logic model element, “Civilians physically and mentally able to perform their jobs,” because this was the FEVS item that best matched with this logic model element.

The resulting set contains 30 FEVS items. For most core items on the survey, employees are asked to respond with a specific level of organization in mind, and a definition for the level is provided in the survey instrument (see Table C.1). For example, some items ask employees to consider their work unit, defined as “your immediate work unit headed by your immediate supervisor,” while others ask employees to consider *senior leaders*, defined as “the heads of departments/agencies and their immediate leadership team responsible for directing the policies and priorities of the department/agency.”¹³ Thus, it might be useful for the Army to analyze items referencing a work unit or immediate supervisor for small organizational components within the Army, while it might be less useful to analyze items referencing the organization and senior leaders at such a granular level.

¹³ OPM, undated-c, p. 75.

TABLE D.1
Proposed Federal Employee Viewpoint Survey Items to Monitor Army Civilian Readiness

Logic Model Level	Logic Model Element	FEVS Item	Level (if Applicable)
Activities	Hire staff and civilians	New hires in my work unit (i.e., hired in the past year) have the right skills to do their jobs.	Work unit
Activities	Provide training support	I am given a real opportunity to improve my skills in my organization.	N/A
Activities	Provide training support	Supervisors in my work unit support employee development.	Supervisor
Activities	Provide equipment	My organization has prepared me for potential physical security threats.	Organization
Activities	Provide equipment	My organization has prepared me for potential cybersecurity threats.	Organization
Activities	Provide retention support	My supervisor supports my need to balance work and other life issues.	Supervisor
Activities	Provide retention support	Senior leaders demonstrate support for work-life balance programs.	Senior leader
Activities	Provide retention support	How satisfied are you with the recognition you receive for doing a good job?	Organization
Activities	Provide retention support	Considering everything, how satisfied are you with your pay?	Organization
Activities	Provide retention support	Are you considering leaving your organization within the next year, and if so, why?	N/A
Activities	Provide oversight	Overall, how good a job do you feel is being done by your immediate supervisor?	Supervisor
Activities	Provide oversight	In my organization, senior leaders generate high levels of motivation and commitment in the workforce.	Senior leader
Activities	Provide oversight	My supervisor provides me with constructive suggestions to improve my job performance.	Supervisor
Activities	Provide oversight	Overall, how good a job do you feel is being done by the manager directly above your immediate supervisor?	Manager
Activities	Provide oversight	I know what is expected of me on the job.	N/A
Activities	Provide oversight	I have enough information to do my job well.	N/A

Table D.1—Continued

Logic Model Level	Logic Model Element	FEVS Item	Level (if Applicable)
Activities	Provide oversight	I am held accountable for the quality of work I produce.	N/A
Activities	Provide oversight	In my work unit poor performers usually . . .	Work unit
Output	Civilian workforce sufficiently staffed	Employees in my work unit are typically under too much pressure to meet work goals.	Work unit
Output	Civilians meet job requirements	My talents are used well in the workplace.	Not applicable
Output	Civilians sufficiently trained for their jobs	I receive the training I need to do my job well.	Not applicable
Output	Civilians fully and appropriately equipped	Employees are protected from health and safety hazards on the job.	Organization
Output	Institutional memory and experience preserved	My work unit has the job-relevant knowledge and skills necessary to accomplish organizational goals.	Work unit
Outcome	Individual readiness	Employees in my work unit produce high-quality work.	Work unit
Outcome	Individual readiness	Employees in my work unit adapt to changing priorities.	Work unit
Outcome	Organizational readiness	The people I work with cooperate to get the job done.	Work unit
Outcome	Organizational readiness	My work unit successfully manages disruptions to our work.	Work unit
Outcome	Organizational readiness	My organization is successful at accomplishing its mission.	Organization
Outcome	Organizational readiness	My organization effectively adapts to changing government priorities.	Organization

SOURCE: Authors' analysis of OPM, Federal Employee Viewpoint Survey Core Items, email to the authors, June 13, 2022.

Metrics for Evaluating Candidates

This appendix presents our evaluation of each candidate readiness metric against validity, reliability, and feasibility. Evaluation of the metrics was performed in an iterative manner based on team members' prior knowledge and experience in the area of readiness. One team member performed an initial evaluation of all metrics, and two additional team members reviewed the assignments separately and suggested any modifications they believed necessary. The group collectively discussed proposed adjustments to ratings and made a final determination on the assigned rating. In some instances, modifications to the metric itself were identified that would increase the evaluation ratings, particularly in the area of validity as described in Chapter 4 (see Table 4.2).

Table E.1 summarizes the evaluation of each of the CIP Working Group's proposed metrics and the additional metrics that we proposed. Explanations for some ratings are provided in the rightmost column when we thought justification was necessary.

TABLE E.1
Metrics for Evaluating Candidates

Metric	Validity	Reliability	Feasibility	Notes
Employee has proper resources and tools for position	High	Low*	Low–Medium**	* Qualitative assessments by management may be subjective. ** Dependent on type of resources and equipment.
New hires complete acculturation process	Low	High	Medium	
Employee has necessary certifications or licenses for position	High	High	Medium	
Employee has approved IDP	Medium*	High	High	* Only relevant to the extent that the IDP addresses gaps in position requirements or an individual's KSA.
Employee has approved Performance Plan	Medium*	High	High	* Only relevant to the extent that the PP addresses gaps in position requirements or an individual's KSA.
Employee has the appropriate technical skills for position	High	Low–Medium*	Medium**	* Self-reporting of skills could be subjective. ** Skills differ by position and may need to be specified.
CES basic course fill rates and graduation rates	Low	High	Medium–High	
CES intermediate course fill rates and graduation rates	Low	High	Medium–High	
CES advanced course fill rates and graduation rates	Low	High	Medium–High	
Continuing education for senior leaders fill rates and graduation rates	Medium	High	Medium–High	
Supervisors properly trained	Medium	High	Medium–High	
Average time to hire	Medium	High	High	
Hiring lag	Medium	High	High	
Civilian workforce is properly equipped	High	Low*	Low–Medium**	* Qualitative assessments by management may be subjective. ** Dependent on type of resources and equipment.
Execution of Army civilian pay	Medium	High	High	

Table E.1—Continued

Metric	Validity	Reliability	Feasibility	Notes
Execution of Army Civilian training and development resources	Medium	High	High	
Appropriated fund military function civilian fill rate	Medium*	Medium	High	* Current definitions suggest this is necessary to calculate (overall) fill rate metric. Likely more beneficial to ensure that metric is tracked by occupation or career field.
Other than APF military function civilian fill rate	Medium*	Low–Medium**	Low–Medium**	* Current definitions suggest this is necessary to calculate (overall) fill rate metric. Likely more beneficial to ensure metric is tracked by occupation or career field. ** Relevant data may be inconsistent and difficult to track (e.g., some position requirements may vary based on customer demand, such as those who work at on-base child care centers).
Fill rate	High*	Medium**	High	* Metric should also be calculated at the occupation or career field levels and not just in aggregate for an organization. ** Requires codified definition of fill rate and how it is to be calculated.
Number of new hires	Medium	High	High	
Workforce losses	Medium	High	High	
Non-retire workforce losses	Medium	High	High	
Geographic dispersion	Low	High	High	
Command disposition	Low	High	High	
Pay structure	Medium → High*	High	High	* Modifications to metric discussed in Table 4.3 increase validity rating from medium to high.
Education level	Medium → High*	High	High	* Modifications to metric discussed in Table 4.3 increase validity rating from medium to high.
Veteran status	Low	High	High	

Table E.1—Continued

Metric	Validity	Reliability	Feasibility	Notes
Diversity, ethnicity, and inclusion status	Low	High	High	
MCO and STEM composition	Medium → High*	High**	High	* Modifications to metric discussed in Table 4.3 increase validity rating from medium to high. ** Requires a codified definition of fill rate and how it is to be calculated.
Attrition and accessions	Medium → High*	High	High	* Modifications to metric discussed in Table 4.3 increase validity rating from medium to high.
Percentage of workforce eligible for retirement	High	High	High	
Army Fellows Program participation	Low	High	Medium	
Future workforce trends	Medium	Medium*	Medium	* Processes for projection are not clear. CIP Working Group noted data inaccuracies.
Leader readiness concerns	Medium	Low	Medium	
Employee meets physical requirements for position	High	High*	Medium	* Assuming this is dependent on a physical fitness test and not self-reporting.
Employee meets nonphysical and nontechnical requirements for job	High	High*	Medium	* Assuming proof is required for some requirements (e.g., vaccination status, current passport).
Employee has completed necessary training requirements	High	High	Medium	
Number of years in position	High	High	High	
Number of years in organization	High	High	High	
Number of years in the Army	High	High	High	

Abbreviations

ACCMMA	Army Civilian Career Management Activity
ACPERS	Army Civilian Personnel System
AMC	Army Materiel Command
APF	appropriated fund
APS	Army People Strategy
ASC	Army Sustainment Command
ATRRS	Army Training Requirements and Resources System
CAE	Component Acquisition Executive
CCDR	Combatant Commander
CDC	Centers for Disease Control and Prevention
CES	Civilian Education System
CIP	Civilian Implementation Plan
CMT	Career Mapping Tool
COVID-19	coronavirus disease 2019
DASA(P)	Deputy Assistant Secretary of the Army for Procurement
DAWIA	Defense Acquisition Workforce Improvement Act
DBB	Defense Business Board
DHS	U.S. Department of Homeland Security
DMDC	Defense Manpower Data Center
DoD	U.S. Department of Defense
DoDI	Department of Defense Instruction
FASCLASS	Fully Automated System for Classification
FEVS	Federal Employee Viewpoint Survey
FFRDC	federally funded research and development center
FMSWeb	Force Management System Web
FWS	Federal Wage System
FY	fiscal year
GAO	U.S. Government Accountability Office
IDP	individual development plan
IOM	Institute of Medicine
IT	information technology
KSA	knowledge, skills, and abilities
MCO	mission critical occupation
MEDCOM	U.S. Army Medical Command

MilTech	military technician
NMS	National Military Strategy
OPM	U.S. Office of Personnel Management
OPLAN	operational plan
PD	position description
PERLC	Preparedness and Emergency Response Learning Center
RAC	Ready Army Civilian
SEA	science, engineering, and analysis
STEM	science, technology, engineering, and mathematics

References

“Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us,” *Military Medicine*, Vol. 181, No. 2, February 2016.

Akdil, Kartal Yagiz, Alp Ustundag, and Emre Cevikcan, “Maturity and Readiness Model for Industry 4.0 Strategy,” in Alp Ustundag and Emre Cevikcan, eds., *Industry 4.0: Managing the Digital Transformation*, Springer International, 2018.

Army Regulation 220-1, *Field Organization: Army Unit Status Reporting and Force Registration—Consolidated Policies*, Headquarters, U.S. Department of the Army, April 15, 2010.

Army Regulation 525-30, *Military Operations: Army Strategic and Operational Readiness*, Headquarters, Department of the Army, April 9, 2020.

Bartlett, Christopher A., and Sumantra Ghoshal, “Building Competitive Advantage Through People,” *MIT Sloan Management Review*, Vol. 43, No. 2, January 15, 2002.

Blayone, Todd J. B., and Roland VanOostveen, “Prepared for Work in Industry 4.0? Modelling the Target Activity System and Five Dimensions of Worker Readiness,” *International Journal of Computer Integrated Manufacturing*, Vol. 34, No. 1, 2021.

Botha, Anthon P., “Rapidly Arriving Futures: Future Readiness for Industry 4.0,” *South African Journal of Industrial Engineering*, Vol. 29, No. 3, 2018.

Campbell, Benjamin A., Russell Coff, and David Kryscynski, “Rethinking Sustained Competitive Advantage from Human Capital,” *Academy of Management Review*, Vol. 37, No. 3, July 2012.

Centers for Disease Control and Prevention, “Logic Models,” webpage, December 18, 2018. As of July 6, 2022:
<https://www.cdc.gov/evaluation/logicmodels/index.htm>

Chairman of the Joint Chiefs of Staff Instruction 3401.02b, *Force Readiness Reporting*, May 31, 2011, current as of July 17, 2014.

Congressional Budget Office, *Replacing Military Personnel in Support Positions with Civilian Employees*, December 7, 2015.

Connor, Jon Micheal, “FEVS Provides Avenue to Leadership, Drives Workplace Change,” U.S. Army, November 16, 2021.

Cooley, William T., and George M. Dougherty, “Every Airman and Guardian a Technologist: Reinvigorating a Disruptive Technology Culture,” *Air and Space Power Journal*, Vol. 35, No. 2, Summer 2021.

DASA(P)—See Deputy Assistant Secretary of the Army for Procurement.

DBB—See Defense Business Board.

Dearing, James W., “Organizational Readiness Tools for Global Health Intervention: A Review,” *Frontiers in Public Health*, Vol. 6, No. 56, March 2, 2018.

Defense Business Board, *Strengthening Defense Department Civilian Talent Management*, Department of Defense, DBB FY22-03, May 18, 2022.

Defense Civilian Personnel Advisory Services, *Strategic Workforce Planning Guide*, May 2019.

Department of Defense Instruction 1120.11, *Programming and Accounting for Active Component (AC) Military Manpower*, Office of the Under Secretary of Defense for Personnel and Readiness, March 17, 2015.

Department of Defense Instruction 1336.05, *Automated Extract of Active Duty Military Personnel Records*, incorporating Change 3, Office of the Under Secretary of Defense for Personnel and Readiness, updated August 26, 2021.

Department of Defense Instruction 1444.02, *Data Submission Requirements for DoD Civilian Personnel*, Vol. 1: *Appropriated Fund (APF) Civilians*, Office of the Under Secretary of Defense for Personnel and Readiness, 2013.

Department of Defense Instruction 5000.66, *Defense Acquisition Workforce Education, Training, Experience, and Career Development Program*, Office of the Under Secretary of Defense for Acquisition and Sustainment, incorporating Change 3, March 25, 2022.

Deputy Assistant Secretary of the Army for Procurement, Career Mapping Tool Demo, briefing given to the authors, April 29, 2022, Not available to the general public.

DoD—See U.S. Department of Defense.

DoDI—See Department of Defense Instruction.

Dolan, Brian, Bonnie L. Triezenberg, Emmi Yonekura, Sandra Kay Evans, Moon Kim, Dwayne M. Butler, Sarah W. Denton, and Shreyas Bharadwaj, *Understanding, Managing, and Reporting U.S. Space Force Readiness*, RAND Corporation, RR-A977-1, 2023. As of June 18, 2023:

https://www.rand.org/pubs/research_reports/RRA977-1.html

Farrell, Brenda S., *Performance Management: DOD Is Terminating the National Security Personnel System, but Needs a Strategic Plan to Guide Its Design of a New System*, U.S. Government Accountability Office, GAO-11-524R, 2011.

Fletcher, J. D., *Cognitive Readiness: Preparing for the Unexpected*, Institute for Defense Analyses, IDA Document D-3061, September 2004.

Floyd, Latosha, and Deborah A. Phillips, “Child Care and Other Support Programs,” *Future of Children*, Vol. 23, No. 2, Fall 2013.

Francis, Kathryn A., and Ramona J. Diaz, “Defense Primer: DOD Appropriated Fund Civilians,” Congressional Research Service, IF 11131, March 12, 2019.

GAO—See U.S. Government Accountability Office.

Gates, Susan M., Christine Eibner, and Edward G. Keating, *Civilian Workforce Planning in the Department of Defense: Different Levels, Different Roles*, RAND Corporation, MG-449-OSD, 2006. As of July 13, 2022:

<https://www.rand.org/pubs/monographs/MG449.html>

Gates, Susan M., Elizabeth Roth, and Jonas Kempf, *Department of Defense Acquisition Workforce Analyses: Update Through Fiscal Year 2021*, RAND Corporation, RR-A758-2, 2022. As of May 6, 2023:

https://www.rand.org/pubs/research_reports/RRA758-2.html

Gates, Susan M., Elizabeth Roth, Sinduja Srinivasan, and Lindsay Daugherty, *Analysis of the Department of Defense Acquisition Workforce: Update to Methods and Results Through FY 2011*, RAND Corporation, RR-110-OSD, 2013. As of May 6, 2023:

https://www.rand.org/pubs/research_reports/RR110.html

- Groeber, Ginger, Kirsten M. Keller, Philip Armour, Samantha E. DiNicola, Irina A. Chindea, Brandon Crosby, Ellen E. Tunstall, and Shreyas Bharadwaj, *Department of the Air Force Civilian Compensation and Benefits: How Five Mission Critical and Hard-to-Fill Occupations Compare to the Private Sector and Key Federal Agencies*, RAND Corporation, RR-A334-1, 2021. As of May 6, 2023:
https://www.rand.org/pubs/research_reports/RR334-1.html
- Harris, Albert III, "Preparing for Multidomain Warfare: Lessons from Space/Cyber Operations," *Air and Space Power Journal*, Vol. 32, No. 3, Fall 2018.
- Hawkins, Kari, "Ready Army Civilian Tool Enables Better-Equipped Employees," U.S. Army, October 28, 2019.
- Hawkins, Kari, "Army Looks to Career Program Managers to Ensure Capable Civilian Workforce," U.S. Army, February 19, 2021a.
- Hawkins, Kari, "AMC Launches Employee Development Tool Aimed at Readiness," U.S. Army, July 16, 2021b.
- Heitmann, Ryan J., Crystal B. Hammons, and Alison L. Batig, "Women's Health Knowledge and Skills Among Transitional Year Internship-Trained Military Medical Officers Serving as Independent Health Care Providers," *Military Medicine*, Vol. 182, No. 7, July–August 2017.
- Heric, Matthew, and Jenn Carter, "Cognitive Readiness Assessment and Reporting: An Open Source Mobile Framework for Operational Decision Support and Performance Improvement," *Performance Improvement*, Vol. 50, No. 7, August 2011.
- Herrera, G. James, *The Fundamentals of Military Readiness*, Congressional Research Service, R46559, October 2, 2020.
- Innovation Network, *Logic Model Workbook*, undated. As of July 6, 2022:
<https://www.innonet.org/news-insights/resources/logic-model-workbook/>
- Institute of Medicine, *A Ready and Resilient Workforce for the Department of Homeland Security: Protecting America's Front Line*, National Academies Press, 2013.
- Institute of Medicine, *Advancing Workforce Health at the Department of Homeland Security: Protecting Those Who Protect Us*, National Academies Press, 2014.
- IOM—See Institute of Medicine.
- Lewis, Jennifer Lamping, Edward G. Keating, Leslie Adrienne Payne, Brian J. Gordon, Julia Pollak, Andrew Madler, H. G. Massey, and Gillian S. Oak, *U.S. Department of Defense Experiences with Substituting Government Employees for Military Personnel: Challenges and Opportunities*, RAND Corporation, RR-1282-OSD, 2016. As of November 9, 2021:
www.rand.org/pubs/research_reports/RR1282.html
- Meza, David, "Knowledge Graphs in People Analytics," video, Hyperight AB, August 17, 2022. As of January 31, 2023:
https://www.youtube.com/watch?v=NdyIni_NAMw
- Morris, Andrea M., Karen A. Ricci, Anne R. Griffin, Kevin C. Heslin, and Aram Dobalian, "Personal and Professional Challenges Confronted by Hospital Staff Following Hurricane Sandy: A Qualitative Assessment of Management Perspectives," *BMC Emergency Medicine*, Vol. 16, 2016.
- Morrison, John E., and J. D. Fletcher, *Cognitive Readiness*, Institute for Defense Analyses, IDA Paper P-3735, October 2002.

Mundell, Benjamin F., Mark W. Friedberg, Christine Eibner, and William C. Mundell, "US Military Primary Care: Problems, Solutions, And Implications for Civilian Medicine," *Health Affairs*, Vol. 32, No. 11, November 2013.

Nienaber, Hester, and Nisha Sewdass, "A Reflection and Integration of Workforce Conceptualisations and Measurements for Competitive Advantage," *Journal of Intelligence Studies in Business*, Vol. 6, No. 1, May 2016.

OPM—See U.S. Office of Personnel Management.

Qari, Shoukat H., Mary R. Leinhos, Tracy N. Thomas, and Eric G. Carbone, "Overview of the Translation, Dissemination, and Implementation of Public Health Preparedness and Response Research and Training Initiative," *American Journal of Public Health*, Vol. 108, Supp. 5, November 2018.

Ross, Shirley M., Irina A. Chindea, John S. Crown, Samantha E. DiNicola, Ginger Groeber, Lawrence M. Hanser, and Jennifer J. Li, *General Officers, Career Field Sustainability, Training Pipelines, and the Civilian Workforce of the Space Force: Considered Options to Enhance Structure and Configuration*, RAND Corporation, RR-A547-1, forthcoming.

Runnels, Al, "United States Coast Guard Financial Management Strategy and Operations," *Armed Forces Comptroller*, Vol. 65, No. 2, Spring 2020.

Stangeland, Paula A., "Disaster Nursing: A Retrospective Review," *Critical Care Nursing Clinics of North America*, Vol. 22, No. 4, December 2010.

Strong, Brian, "Creating Meaningful Business Continuity Management Programme Metrics," *Journal of Business Continuity & Emergency Planning*, Vol. 4, No. 4, November 2010.

Tentama, Fatwa, and Eva Riyansha Riskiyana, "The Role of Social Support and Self-Regulation on Work Readiness Among Students in Vocational High School," *International Journal of Evaluation and Research in Education*, Vol. 9, No. 4, December 2020.

U.S. Army, *Science, Engineering and Analysis Army Career Field Strategic Workforce Plan*, October 15, 2021, Not available to the general public.

U.S. Army, *Army People Strategy—Civilian Implementation Plan*, 2022.

U.S. Army, "Army People Strategy—Civilian Implementation Plan, Civilian Readiness Information Requirements Pilot Review (Task E-1.3.2)," briefing, March 10, 2022, Not available to the general public.

U.S. Code, Title 5, Government Organization and Employees.

U.S. Code, Title 32, National Guard.

U.S. Department of Defense, *Defense Acquisition Workforce Data Reporting Standards Guide*, Under Secretary of Defense for Acquisition, Technology, and Logistics, July 20, 2017a.

U.S. Department of Defense, *Defense Acquisition Workforce Program Desk Guide*, Under Secretary of Defense for Acquisition, Technology, and Logistics, July 20, 2017b.

U.S. Department of Defense, Office of the Inspector General, *Human Capital: Report on the DoD Acquisition Workforce Count*, D-2006-073, April 17, 2006.

U.S. Department of the Army, "Acquisition Workforce Senior Policy Analyst Position Description," webpage, November 14, 2018. As of July 13, 2022:
https://acpol2.army.mil/fasclass/search_fs/search_fs_output.asp?fcp=zutpk3eFRtaToL2jorZGuam0buidbYOXlahVgWC7hLBpZIGemas%3D

- U.S. Department of the Army, "Management Analyst Position Description," webpage, June 9, 2007. As of July 13, 2022:
https://acpol2.army.mil/FASCLASS/search_fs/search_fs_output.asp?fcp=zutpk3eFRtaToL2jq8dGuam0buidbYCblaZXf2C7hLBIZn%2BWkag%3D
- U.S. General Accounting Office, *A Model of Strategic Human Capital Management: Exposure Draft*, GAO-02-373SP, 2002.
- U.S. Government Accountability Office, "High Risk List," webpage, undated. As of July 15, 2022:
<https://www.gao.gov/high-risk-list>
- U.S. Government Accountability Office, *High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas*, GAO-21-119SP, 2021.
- U.S. Office of Personnel Management, "Federal Employee Viewpoint Survey: About," webpage, undated-a. As of July 15, 2022:
<https://www.opm.gov/fevs/about/>
- U.S. Office of Personnel Management, "Federal Employee Viewpoint Survey: Public Data File," webpage, undated-b. As of July 15, 2022:
<https://www.opm.gov/fevs/public-data-file/>
- U.S. Office of Personnel Management, "Federal Employee Viewpoint Survey: Technical Reports," webpage, undated-c. As of July 15, 2022:
<https://www.opm.gov/fevs/reports/technical-reports>
- U.S. Office of Personnel Management, *Federal Employee Viewpoint Survey: Technical Report*, 2017.
- U.S. Office of Personnel Management, *Federal Employee Viewpoint Survey: Technical Report*, 2020.
- U.S. Office of Personnel Management, *Federal Employee Viewpoint Survey Results: Governmentwide Management Report*, 2021a.
- U.S. Office of Personnel Management, *Office of Personnel Management Federal Employee Viewpoint Survey: Report by Agency*, 2021b.
- Valdez, Christine D., and Thomas W. Nichols, "Motivating Healthcare Workers to Work During a Crisis: A Literature Review," *Journal of Management Policy and Practice*, Vol. 14, No. 4, January 2013.
- Walker, David M., *Human Capital: DOD's Civilian Personnel Strategic Management and the Proposed National Security Personnel System, testimony before the Subcommittee on Oversight of Government Management, the Federal Workforce and the District of Columbia, Senate Committee on Governmental Affairs*, U.S. General Accounting Office, GAO-03-493T, May 12, 2003.
- Wesensten, Nancy J., Gregory Belenky, and Thomas J. Balkin, "Cognitive Readiness in Network-Centric Operations," *US Army War College Quarterly: Parameters*, Vol. 35, No. 1, Spring 2005.
- Young, Stephanie, Henry H. Willis, Melinda Moore, and Jeffrey Engstrom, *Measuring Cooperative Biological Engagement Program (CBEP) Performance: Capacities, Capabilities, and Sustainability Enablers for Biorisk Management and Biosurveillance*, RAND Corporation, RR-660-OSD, 2014. As of May 6, 2023:
https://www.rand.org/pubs/research_reports/RR660.html
- Wallace, Jon R., "Field Test of a Peer Support Pilot Project Serving Federal Employees Deployed to a Major Disaster," *Social Work and Christianity*, Vol. 43, No. 1, Spring 2016.

Ward, Dan L., Rob Tripp, and Bill Maki, *Positioned: Strategic Workforce Planning That Gets the Right Person in the Right Job*, AMACOM, 2013.

Webster, Andrew, and John Gardner, "Aligning Technology and Institutional Readiness: The Adoption of Innovation," *Technology Analysis and Strategic Management*, Vol. 31, No. 10, 2019.

Weiner, Bryan J., "A Theory of Organizational Readiness for Change," *Implementation Science*, Vol. 4, 2009.

Weiner, Bryan J., Halle Amick, and Shoou-Yih Daniel Lee, "Conceptualization and Measurement of Organizational Readiness for Change: A Review of the Literature in Health Services Research and Other Fields," *Medical Care Research and Review*, Vol. 65, No. 4, August 2008.



The Army's civilian workforce plays a critical role in supporting the Army's mission. The U.S. Department of Defense (DoD) and Army policies have focused on workforce planning, management issues, and, more specifically, the contributions of the civilian workforce to strategic readiness. This has increased interest in the concept of civilian workforce readiness and how it might be measured. In this context, the Army asked RAND Arroyo Center to develop a method for measuring the readiness of its civilian workforce. This method is grounded in the definition of Army civilian readiness that RAND researchers developed in this report. The proposed metrics for assessing readiness are meant to inform policies and practices related to sizing and management of the Army civilian workforce.

In conducting this research, the RAND team reviewed relevant literature and policy documents related to workforce readiness, conducted interviews with stakeholders across the Army and DoD, developed a logic model that both reflected the definition of civilian workforce readiness proposed by RAND researchers and supported the identification of promising readiness metrics, and reviewed U.S. government databases to identify potential sources of data that could be used in measuring civilian readiness.

\$27.50

www.rand.org

ISBN-10 1-9774-1153-3
ISBN-13 978-1-9774-1153-2



9 781977 411532

52750