

IDA | Research Summary



Enhancing Ground Equipment Readiness in the Army National Guard

Equipment readiness is central to the training and deployment of U.S. Army National Guard (ARNG) units. To assist ARNG leaders in efficiently allocating scarce resources across readiness investments, IDA quantified the causal effect of ARNG military technician (MilTech) staffing levels on ground equipment readiness.

Each month, the U.S. Department of the Army assesses the mission readiness of each unit's required equipment portfolio based on the amount of time the equipment is "mission capable" and available for use. Dual-status MilTechs—federal civilian employees who serve in the Selected Reserve as a condition of their civilian employment—comprise the staff in the maintenance facilities that perform the majority of inspections, repairs, and upgrades required to generate and maintain the readiness of ARNG ground equipment.

The longer an equipment item is unavailable due to inspection or maintenance, the lower the owning unit's level of equipment readiness. Using survival analysis regression methods, IDA researchers estimated the marginal impact of additional MilTech maintenance personnel on vehicle work order duration at Field Maintenance Shop (FMS), Combined Support Maintenance Shop (CSMS), and Maneuver Area Training and Equipment Site (MATES) facilities. The analysis covered 16,000 individual ARNG MilTechs working approximately 564,000 months at more than 550 facilities between October 2010 and June 2015. To isolate the effect of staffing levels from the influence of other factors on work order duration, IDA researchers held constant the influence of features such as work type, difficulty, and priority level; annual and event-based operating schedule of the ARNG; and maintenance facility characteristics.

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IDA researchers found that adding MilTech vehicle and electronics maintenance personnel results in economically meaningful and statistically significant reductions in the length of time that ARNG vehicles remain in a mission-incapable state. Investments in vehicle maintainers generate the largest increase in ready equipment days at FMS facilities that have moderate to high numbers of work orders per maintainer. The graphics on the right illustrate the projected increase in annual vehicle ready days resulting from an increase in MilTech staffing levels at different types of maintenance facilities.

The IDA team found that across all FMS facilities, an additional vehicle maintainer reduces the duration of an average vehicle work order by about 0.8 working days. This reduction in vehicle down-time accumulates across all work orders received by the facility per year. Adding one vehicle maintainer to each of the 472 FMS facilities studied is therefore expected to generate approximately 79,000 additional ready equipment days each year across the ARNG, holding other factors constant.

At CSMS and MATES facilities, IDA similarly found that the addition of one vehicle or one electronics maintainer decreases the average vehicle work order duration by 0.4 or 0.7 working days per work order, respectively. All else being equal, adding one vehicle and one electronics maintainer to each of the 81 CSMS and MATES facilities studied—162 total personnel—would produce approximately 25,000 additional ready equipment days each year.

At FMS facilities, adding a single vehicle maintainer produces significant improvements in vehicle readiness.

Workload per maintainer	Change in vehicle ready days per year resulting from one additional maintainer
High	+202 ready days
Moderate	+217 ready days
Low	+81 ready days

At CSMS and MATES facilities, adding a single vehicle maintainer or a single electronics maintainer produces significant improvements in vehicle readiness.

Additional maintainer type	Change in vehicle ready days per year resulting from one additional maintainer
Vehicle maintainer	+121 ready days
Electronics maintainer	+191 ready days



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Based on IDA Paper P-10334, *Assessing the Impact of Military Technicians on Ground Equipment Readiness in the Army National Guard*, J. A. Pechacek, D. W. Kuo, N. T. Latshaw, and E. W. Novak, January 2019.