

GAO Highlights

Highlights of [GAO-21-197](#), a report to the Subcommittee on Transportation, and Housing and Urban Development, and Related Agencies, Committee on Appropriations, House of Representatives

Why GAO Did This Study

Automated technologies in planes, trains, and passenger vehicles are in use today and likely to become increasingly widespread. While these technologies hold promise, accidents involving them demonstrate potential safety challenges. DOT is responsible for overseeing the safety of all modes of transportation.

This report addresses: (1) stakeholders' perspectives on the skills required to oversee automated technologies; (2) the extent to which DOT has identified and assessed the skills it needs to oversee these technologies; and (3) the extent to which DOT has developed strategies to address any gaps in skills. GAO reviewed relevant literature and DOT workforce planning documents, and interviewed DOT human capital officials, selected modal administrations, and stakeholders, including transportation associations and technology developers. GAO selected modal administrations based in part on the prevalence of automated technologies.

What GAO Recommends

GAO is making four recommendations, including that DOT: (1) assess skill gaps in key occupations involved in overseeing automated technologies and (2) regularly measure the progress of strategies implemented to close skill gaps. DOT concurred with three recommendations and partially concurred with one on measuring progress. GAO clarified this recommendation and believes its implementation is warranted.

View [GAO-21-197](#). For more information, contact Heather Krause at (202) 512-2834 or krauseh@gao.gov.

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AUTOMATED TECHNOLOGIES

DOT Should Take Steps to Ensure Its Workforce Has Skills Needed to Oversee Safety

What GAO Found

Stakeholders GAO interviewed said that federal oversight of automated technologies—such as those that control a function or task of a plane, train, or vehicle without human intervention—requires regulatory expertise as well as engineering, data analysis, and cybersecurity skills. Stakeholders also stated that as automated systems become more common across transportation modes, overseeing them will require understanding vehicle operating systems, software code, and the vast amounts of data produced by these systems to ensure their safety.

Skills Needed to Oversee the Safety of Automated Technologies, according to Stakeholders

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|  Regulatory expertise Many regulations as written may not account for automated technologies |  Engineering Mechanical systems are increasingly being replaced with electronic and computerized systems |  Data analysis Automated technologies produce vast and disparate data |  Cybersecurity The risk of cyberattack grows with increasing automation |
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Source: GAO analysis of stakeholder interviews. | GAO-21-197

The U.S. Department of Transportation's (DOT) Departmental Office of Human Resources Management has identified most skills DOT needs to oversee automated technologies, but it has not fully assessed whether its workforce has these skills. Through its workforce planning efforts, DOT identified many of the skills cited by stakeholders as important for overseeing automated technologies—regulatory expertise, engineering, and data analysis. In 2016 and 2020, DOT surveyed staff in related positions and identified gaps in some of these skills, including regulatory expertise. However, DOT did not survey staff or assess skill gaps in data analysis or cybersecurity positions important to automated technology oversight. As a result, DOT lacks critical information needed to identify skill gaps and ensure key relevant staff are equipped to oversee the safety of these technologies now and in the future.

DOT developed strategies to address some but not all gaps in skills needed to oversee automated technologies. For example, DOT implemented some recruiting strategies and established hiring goals as a means of closing gaps identified in the 2016 survey and plans to continue these efforts in light of the 2020 survey. However, DOT has not tracked the progress of strategies implemented to close skill gaps since the 2016 survey, nor has it implemented training strategies. Accordingly, some skill gaps related to overseeing the safety of automated technologies will likely persist in DOT's workforce.