

Stacy Murphy
Deputy Chief Operations Officer/Security Officer
Office of Science and Technology Policy
Executive Office of the President
Eisenhower Executive Office Building
1650 Pennsylvania Avenue
Washington, DC 20504

**Re: Request for Information on Technology Roadmap To Increase Wildfire Firefighting Capabilities
(Federal Register Number 2025-18121)**

Dear Stacy Murphy,

The Federation of American Scientists (FAS) is a nonprofit, nonpartisan organization that works to advance science and technology in the public interest. FAS has established itself as an influential convener, network builder, and thought leader on wildfire issues.¹

Thank you for the opportunity to provide input to inform the Technology Roadmap To Increase Wildfire Firefighting Capabilities. We will focus this comment on the following elements that we think should be emphasized in the development of the roadmap:

1. Leveraging the existing body of work on wildfire technology needs and opportunities;
2. Balancing investments in technology for suppression with investments in technology for risk reduction;
3. Innovating to protect wildland firefighters from the health impacts of wildfire smoke;
4. Providing substantive opportunities for end users of technology to give iterative input;
5. Ensuring that employees and first responders can make the best use of available data, including federal data, by prioritizing data standardization and interoperability;
6. Addressing administrative barriers to technology adoption.

More information about each of these elements is provided below.

1. Leveraging the existing body of work on wildfire technology needs and opportunities

The current wildfire management system is inadequate in the face of increasingly severe and damaging wildfires. Change is urgently needed. Acknowledging this need was the impetus behind the consensus-building work of the Wildland Fire Mitigation and Management Commission² as well as substantial legislative proposals that have emerged since, including the S. 1462, the *Fix Our Forests Act* (which FAS endorsed)³. In developing the roadmap, we encourage you to review the substantial body of work developed in the last several years that provides evidence-based recommendations for improving the use of technology in building wildfire resilience at various levels of government. The roadmap should clearly articulate how it will build on prior federal efforts. Examples of prior work include:

¹ <https://fas.org/initiative/wildland-fire/>

² <https://www.usda.gov/sites/default/files/documents/wfmmc-final-report-09-2023.pdf>

³ <https://fas.org/publication/position-on-the-senate-companion-of-the-fix-our-forests-act/>

- **ON FIRE: The Report of the Wildland Fire Mitigation and Management Commission (2023).**⁴ Chapter 6, which focuses on integrating modern science and technology, is particularly relevant and includes recommendations related to supporting decision-making and accelerating technology.
- **Wildland Fire Mitigation and Management Commission Aerial Equipment Strategy Report (2023).**⁵ Among other things, this report highlights “the need to develop an overarching, forward-looking aviation strategy that drives procurement...the need to invest in both technology and people to build an aviation fleet that meets long-term demand; and the need to take an inclusive approach to the range of functions aerial resources can serve and the range of entities that must be included in development of a truly national—rather than federal—aviation strategy” and discusses specific mechanisms for achieving these ends.
- **President’s Council of Advisors on Science and Technology Report to the President on Modernizing Wildland Firefighting to Protect Our Firefighters (2023).**⁶ This report provided short- and long-term recommendations for investments to ensure that firefighters are prepared for the future of wildfires.

2. Balancing investments in technology for suppression with investments in technology for risk reduction

Wildfire suppression is critical for protecting people, property, and livelihoods. But with wildfire suppression costs ballooning, suppression must be efficient, targeted, and used only where needed. Federal agencies should prioritize deploying suppression resources where fire presents an imminent danger to people, property, and livelihoods, such as ignitions in the wildland urban interface (WUI). Thankfully, many of the tools needed for smart suppression (e.g., AI-powered ignition detection, satellite-enabled wildfire monitoring) already exist today. The key is to scale and deploy these tools effectively. Support for research, predictive modeling, and real-time fire data and information is also needed to enable precise, timely wildfire response and suppression.

At the same time, we must recognize that suppression is expensive and can even be counterproductive—over-suppression today can make fires worse tomorrow.⁷ Letting wildfires burn in a responsible and controlled way where those fires present limited risk, such as deep within undeveloped forested area, is a common-sense use of resources and will build long-term wildfire resilience.

Therefore, the roadmap should provide a clear vision for how the federal workforce as well as subnational entities will be well-equipped to continue critical risk reduction work in addition to wildfire response. Federal agencies have contributed to a buildup of hazardous wildfire fuels on our landscape by prioritizing suppression for nearly a century—creating risks of catastrophic megafires that even the best tools struggle to suppress. To address this systemic problem, we must invest in preparedness and resilience alongside suppression. Proactive risk management is fiscally responsible; there is a seven-dollar return on investment for every dollar spent on fuel treatments and forest management informed

⁴ <https://www.usda.gov/sites/default/files/documents/wfmmc-final-report-09-2023.pdf>

⁵ <https://www.usda.gov/sites/default/files/documents/wildfire-commission-aviation-report.pdf>

⁶ https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/02/PCAST_Wildfires-Report_Feb2023.pdf

⁷ <https://www.nwfirescience.org/sites/default/files/publications/s41467-024-46702-0.pdf>

by fire research.⁸ Investments in technology can support safe, more targeted prescribed burns and enable prioritization of risk reduction activities that will maximize benefits to ecosystems, recreation areas, and water supplies in addition to reducing the risk of catastrophic wildfire.

3. Innovating to protect wildland firefighters from health impacts of wildfire smoke

Exposure to PM2.5, a major component of wildfire smoke, has been associated with short and long term health impacts on wildland firefighters.⁹ We must do more to protect our wildland firefighters from these health impacts.¹⁰ Specifically, the federal government should develop or procure personal protective equipment (PPE) that is specifically designed for the unique hazards and demands of wildland firefighting. In addition to ensuring sufficient PPE, the federal government should work to better understand the risks posed by long-term exposure to wildfire smoke, communicate those risks, and protect those working alongside wildfire in the built and natural environments. Additional actions that the federal government should take to protect wildland firefighters, discussed in more detail in a recent FAS publication, include studying the long-term impacts of wildland firefighting on human health as well as developing technologies, tactics, and practices that reduce the amount of time that wildland firefighters spend at the highest levels of wildfire smoke exposure.¹¹

4. Providing substantive opportunities for end users of technology to give iterative input

Creating opportunities for land managers and firefighters to provide iterative feedback on the development of tools and technologies can ensure that tools and technologies developed at the federal level are as useful as possible for firefighters, land managers, and others at state and local levels, resulting in a more functional and cost-effective firefighting ecosystem. For digital products, shifting towards a product model rather than project management model can support iterative user input.¹² Jennifer Pahlka, a Senior Fellow with FAS, has written extensively about this product model (which she calls “the art of deciding what to do”) and how to deploy it in government. Applying product management funding mechanisms and approaches in government can result in more functional digital products delivered more quickly.¹³ Resourcing, including trained user experience experts, are key to successfully deploying the product management model.

5. Ensuring that employees and first responders can make the best use of available data, including federal data, by prioritizing data standardization and interoperability

We concur with OSTP that “establishing data standardization and interoperability requirements to facilitate seamless data-sharing, and tools that will improve situational awareness for Federal, State, local, tribal, and territorial governments and private stakeholders” should be a high priority for the federal government. Close coordination with other emerging federal efforts to this end, including activities undertaken by the Wildland Fire Intelligence Center proposed in S. 1462, should be a priority to prevent duplication of effort at various levels of government. Establishing data standards and

⁸ <https://research.fs.usda.gov/fire>

⁹ <https://pmc.ncbi.nlm.nih.gov/articles/PMC9008597/>

¹⁰ <https://fas.org/publication/n95-firefighters/>

¹¹ <https://fas.org/publication/n95-firefighters/>

¹² <https://www.niskanencenter.org/the-product-operating-model-how-government-should-deliver-digital-services/>

¹³ <https://www.eatingpolicy.com/p/project-vs-product-funding>

interoperability requirements will also support more effective development and deployment of artificial intelligence tools for suppression, risk reduction, and recovery.

Coordinated data systems, improved data interoperability, and enhanced data accessibility can help state and local decision-makers make the most of existing information and facilitate development of effective technology. Data managers should seek to integrate state and local data and should be accessible to non-federal partners. When working with Tribes, care should be taken to ensure data sovereignty and confidentiality where requested.

6. Addressing administrative barriers to technology adoption

Per the Wildland Fire Mitigation and Management Commission’s recommendation 117, agencies should work with Congress to ensure that “procurement and contracting...allow for more flexible partnerships with private industry and non-governmental partners.” See recommendation 117 of the Commission report for more information about specific mechanisms.¹⁴ As one example, Congress could provide relevant federal fire agencies with Other Transaction Authority (OTA) already granted to the National Aeronautic and Space Administration (NASA). Agencies with OTA authority can enter into transactions other than procurement contracts, grants, or cooperative agreements, meaning they do not need to comply with the Federal Acquisition Regulation (FAR). As FAS staff have discussed in prior publications, OTA authorities must be leveraged “to its full statutory extent” by relevant agencies in order to have maximum benefits for technology acquisition.^{15,16}

Additionally, as the Environmental Policy Innovation Center noted in a 2024 report on adopting innovation in the U.S. Forest Service, it is also crucial for federal government entities to develop “well-known entry points.”¹⁷ Having a designated point of contact at the relevant agency and a clear path to working with the government will support technology providers in bringing their innovations to the public sector. It can also support state and local governments in contacting relevant stakeholders in the federal government to coordinate on technology projects.

Thank you for your consideration. Please do not hesitate to reach out to Jessica Blackband (jblackband@fas.org) if you have any questions about these comments or if we can be of any further assistance.

Sincerely,

Jessica Blackband
Senior Manager, Climate and Environment
Federation of American Scientists

¹⁴ <https://www.usda.gov/sites/default/files/documents/wfmmc-final-report-09-2023.pdf>, p. 212

¹⁵ <https://fas.org/publication/other-transactions-accelerate-the-clean-energy-transition/>

¹⁶ <https://fas.org/wp-content/uploads/2024/07/JULY-2024-CRITICAL-MINERALS.pdf>

¹⁷ <https://www.policyinnovation.org/insights/usfsinnovationreport>