# U.S. Department of Transportation Report on the Implementation of Executive Order 14303, Restoring Gold Standard Science

## Purpose and Scope

This report on implementation of Executive Order (E.O.) 14303 by the U.S. Department of Transportation (DOT) summarizes how the principles of Gold Standard Science (GSS) will be upheld and applied across all scientific and research activities. It reflects the Department's commitment to ensuring that all federally funded science is rigorous, transparent, and publicly accountable forming a trusted foundation for transportation innovation, operations, and policy development.

This report gives an overview of key responsibilities and oversight mechanisms necessary to keep DOT science credible and impactful in its mission. DOT's implementation of E.O.14303 builds on longstanding Federal mandates and frameworks, including the Foundations for Evidence-Based Policymaking Act, the Information Quality Act, and the Department's own statutory research coordination duties. By aligning with E.O. 14303 and guidance from the Office of Science and Technology Policy (OSTP), this report ensures that the GSS principles are embedded in how research is proposed, conducted, reviewed, and applied throughout the Department.

## Grantmaking Requirements

E.O.14332, "Improving Oversight of Federal Grantmaking" (August 7, 2025) requires that all DOT grantmaking activities incorporate a commitment from grantees to uphold the principles of GSS. The Department will ensure that GSS commitments are incorporated into relevant Notices of Funding Opportunity (NOFO), grant agreements, and cooperative agreements.

## Leadership Roles in Advancing Gold Standard Science

The successful execution of GSS in DOT's GSS Implementation Plan across the Department hinges on the coordinated efforts of DOT's science leadership. The Assistant Secretary for Research and Technology serves as the Department's lead authority on scientific and research-related matters, reporting directly to the Secretary of Transportation and providing high-level oversight, coordination, and accountability for the Department's scientific, technical, and

research activities. The Director of the Office of Research, Development, and Technology (the Director) serves as the department-wide lead responsible for ensuring that GSS principles are embedded in policy, practice, and oversight. The Director guides alignment across each Operating Administration (OA), resolves cross-cutting science issues, and oversees the use of artificial intelligence (AI) and other technologies that support GSS implementation, along with associated metrics.

Each OA will identify a point of contact, ideally an existing staff member, to serve as a GSS liaison. This individual will coordinate as workloads allow and escalate any capacity gaps to the Director. Together, the Director, the GSS liaison, and DOT leadership will ensure that GSS is not only a set of principles but a standard of scientific practice, governing and monitoring how research is selected, conducted, evaluated, and communicated. This collaboration is essential to building a research culture that values transparency, rigor, and public benefit, and to ensuring that the Department's science portfolio upholds the highest standards of credibility and relevance. This coordinated effort will position the United States at the forefront of global transportation innovation.

## Tenets of Gold Standard Science

A central pillar of the Department's GSS implementation action will be issuing a new DOT Science Policy that effectuates and implements the GSS tenets, and integrates the Department's existing standards and processes, including statutory research coordination and review functions, the DOT Public Access Plan, and existing scientific integrity safeguards.

### 1. Reproducible

- Research teams will be required to document their methodologies, share data, and provide source code when feasible.
- DOT will encourage that reproducibility plans are included in proposals and final reporting.
- Training will be offered through modular short video clips to efficiently and without added burden support staff, researchers, and contractors in meeting expectations.

### 2. Transparent

- Researchers will be encouraged to inform their leadership of their hypotheses and intended methods or evaluation protocols prior to initiating the research, to promote transparency and research integrity.
- Final research reports, datasets, and, where necessary to confirm results and/or conclusions, source code will be submitted to approved repositories as directed in the funding award and in accordance with an approved Data Management Plan. Any claims of proprietary information or other bases for withholding source code will have to be acknowledged in the Data Management Plan.

### 3. Communication of Error and Uncertainty

- Research reports will have to clearly describe any limitations of the results and the level of confidence of the researchers in the findings, while avoiding claims that exceed what the data can support.
- DOT will encourage researchers to consider using visual tools, such as charts showing error ranges or confidence intervals, to help communicate uncertainty clearly. These tools will be recommended but not mandatory, allowing flexibility to accommodate project needs and resources.

### 4. Collaborative and Interdisciplinary

- Joint research collaboration between OAs, and where applicable, with external partners and other government agencies are already required in the Department's annual modal research plans (AMRP) to maximize use of financial and other Federal assets and avoid duplication of efforts.
- Shared research tools and platforms will be considered, where feasible, to facilitate collaboration.

### 5. Skeptical of Findings and Assumptions

- Research methodologies will be required to question assumptions and consider alternative explanations to interpreting the results, helping to strengthen the overall research approach.
- Peer reviewers will be required to identify potential bias and evaluate proposals based on scientific soundness and critical thinking.

### 6. Structured for Falsifiability of Hypotheses

- Proposed studies will be required to define clear, testable hypotheses, identify potential outcomes that would disprove them, and highlight any significant deviation from the original research plan.
- Findings that do not confirm the original hypothesis will be required to be documented and reported, as they contribute to scientific understanding and improve future studies.

### 7. Subject to Unbiased Peer Review

- OAs will be encouraged to use existing peer review procedures to ensure reviewers are qualified, and free from conflicts of interest.
- Peer review processes will ensure fairness, transparency, and scientific integrity, ensuring proposals are evaluated based on merit and alignment with GSS principles.
- NOFOs will clearly include review criteria that align with the principles of GSS.

### 8. Accepting of Negative Results as Positive Outcomes

- Researchers will be expected to report all findings, including the results that do not support the original hypothesis.
- Final reports will describe unexpected or inconclusive results and explain their significance for future research, policy, or practice. Sharing such negative results will be

encouraged to promote transparency and collective learning, helping to prevent duplication of efforts, provide valuable insights into what does not work, and better guide future research directions.

### 9. Without Conflicts of Interest

- Researchers, reviewers, and staff will be required to disclose financial or institutional relationships that could influence reporting of the research.
- Each OA will be encouraged to follow its current procedures to collect, review, and store Conflict of Interest (COI) disclosures.
- Public-facing documents, like journal articles or reports, will be required to include a standard COI disclaimer to promote transparency and trust.

After establishing the GSS tenets, it is essential that OAs equip staff and researchers with the knowledge and tools needed to apply these principles in practice. Success depends not only on clear policies and expectations but also on consistent understanding and execution across the Department. The following section outlines how DOT will provide targeted internal training and accessible resources to support GSS implementation.

## Internal Readiness and Oversight for GSS Implementation

### Training and Resources

The Department will issue clear GSS guidance documents and short recorded tutorials through existing intranet channels. When possible, GSS liaisons will also host informal Q&A sessions. The effectiveness of this training will be assessed periodically through feedback and evaluation.

### Coordination and Collaboration

The Department will encourage internal collaboration among OAs to share best practices, address common challenges, promote joint research initiatives, and leverage interdisciplinary expertise for effective GSS implementation and tackling complex scientific challenges.

### Governance, Oversight, and Handling Violations

The Department will rely on existing internal procedures and departmental policies to manage scientific integrity and ensure adherence to GSS principles. The Director is designated as the Scientific Integrity Official responsible for receiving and addressing any allegations of scientific misconduct or integrity violations and will do so using existing policy frameworks.

### Leveraging Existing Processes

The Department's GSS Implementation Plan will make use of existing departmental processes for assuring GSS wherever possible. The Office of the Assistant Secretary for Research and

Technology (OST-R) will be responsible for leading this effort as part of its statutory research coordination and review role. This process can be summarized into the following elements:

- The **DOT RD&T 5-year Strategic Plan**, which defines DOT's strategic research priorities and objectives, technology transfer processes, and Key Performance Indicators (metrics) for the Department's RD&T portfolio over a 5-year horizon.
- **Annual Modal Research Plans (AMRPs)** developed by each OA annually for the coming fiscal year, for review and approval by OST-R.
- Databases like the **Performance Management Data System (PMDS)** and **DOT Research Hub** used to manage and monitor the Department's research projects, and to be provided publicly to ensure transparency.
- The **DOT Public Access Plan** that ensures public access to publications, digital data sets supporting research conclusions, and software, when appropriate, arising from DOT-managed research programs, consistent with applicable laws and policies. These materials will include clear disclosures of key assumptions, uncertainties, and limitations to promote transparency and public understanding.

## Metrics for Adherence to GSS Tenets

To assess adherence to the GSS tenets, DOT will track key indicators, including reproducibility statements and data deposits, during regular project reviews. The scope and frequency of these reviews will be adjusted based on each OA's available resources.

## Leveraging Technology for Implementation and Compliance

The Department will consider piloting AI or analytics tools on a case-by-case basis to support the use of GSS principles and improve the efficiency of compliance-related activities. Broader use will be considered only if the pilots show clear benefits and resources are available for ongoing use.

## Commitment to the Future

The GSS represents another step forward in how the DOT supports, evaluates, and applies best practices in its scientific research. By embedding the tenets of transparency, rigor, and accountability into every stage of the research process, DOT affirms its commitment to scientific excellence in service of public good. This Report on the Implementation of E.O. 14303 is a strategic framework for elevating the quality, credibility, and relevance of transportation research across the Department. It will enable OAs to build on existing practices while aligning with unified, high- integrity standards. Through strong leadership, tailored implementation, and coordinated oversight, GSS will shape a research environment where robust, reproducible, and meaningful science thrives. By institutionalizing these principles, the Department will secure a future where transportation research drives innovation, informs sound policy, and earns public trust. This foundation will not only benefit today's stakeholders but will also ensure that America remains a global leader in transportation science and innovation for generations to come.