



# Adaptation and Accountability: The Role of GAO's Disaster Resilience Framework in System-Wide Action

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Disaster Resilience Framework: Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters ([GAO-20-100SP](#), 10/23/19)

Climate Resilience: Opportunities to Improve Federal Planning and Implementation ([GAO-22-105688](#), 3/8/22)

# Resilience is the New Sustainability

## It has no meaning without context

1. What are you making resilient to what and over what timeframe?
2. What is the federal role?
3. . . . an outcome pursued through actions to reduce risk; that is, to address known hazards (hazard mitigation) and the effects of climate change (climate adaptation).
4. You can make federal programs for any part of the disaster cycle more resilient to changes in the climate: pre-disaster, preparedness, response, and recovery.
5. GAO is trying to help the federal government buy down risk before a disaster strikes instead of the current reactive, fragmented, more expensive approach.

## It's important because . . .

- High Risk, [Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks](#)
- . . . since 2005, federal funding for disaster assistance has approached half a trillion dollars, most recently for catastrophic hurricanes, flooding, wildfires, and other losses. Investing in disaster resilience can help limit damage and costs in the aftermath of a weather event.



# Approaches for Monitoring and Evaluating Federal Climate Resilience Activities

## Classic oversight

- Often backward looking
- How efficiently and effectively have FEMA, HUD, SBA, and other agencies administered major disaster recovery programs?
- What controls are in place to reduce waste, fraud and abuse and how well do they work?

## Strategic insight and foresight

- Forward looking
- How can we proactively manage federal fiscal exposures from climate change and natural disasters?
- High Risk List: Limiting Federal Fiscal Exposure by Better Managing Climate Change Risks
- Disaster Resilience Framework





# Climate Resilience Risk-reduction Approaches

## Mainstreaming

(Bake it in)

- Flood Risk Management Infrastructure
- Agriculture Programs
- Federally Funded Roads
- Superfund sites
- Water systems
- Defense facilities
- Energy infrastructure

## Strategic

(Gaps / New Institutions)

- National Climate Information System
- Identify (and fund) high-priority adaptation projects
- Climate migration pilot program

The Disaster Resilience Framework can be used to evaluate federal mainstreaming efforts and gaps in current approaches that may require new institutions.

# Disaster Resilience Framework

GAO

October 2019

## Disaster Resilience Framework

*Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters*



GAO-20-100SP

- Organized around 3 principles—information, integration, and incentives—and a series of questions.
- Principles can help:
  - Officials that manage federal programs consider actions they might take to increase resilience to climate change and natural hazards.
  - Identify gaps in existing federal efforts or analyze any type of existing federal effort.
- Foresight Evaluation
  - No “gotchas”
  - Make the case for the positive effect—use the principles, but don’t recommend something because the “framework says so”
- NOT A CHECKBOX CRITERIA.
  - It should be adapted to the context.

# Information

To what extent could federal efforts:

- ▶ generate and share additional information that would help decision makers understand their disaster risk?
- ▶ reduce the complexity of and translate risk information for nontechnical audiences?
- ▶ help leverage and synthesize disaster risk information from other partners across agencies, governments, regional organizations, and sectors?
- ▶ help decision makers identify and select among disaster risk-reduction alternatives?
- ▶ provide technical assistance to help build capacity of nonfederal partners?



## Information

Accessing information that is authoritative and understandable can help decision makers to identify current and future risk and the impact of risk-reduction strategies.

# Integration

To what extent could federal efforts:

- ▶ help to establish overarching strategies that guide national resilience efforts?
- ▶ ensure consistent and complementary policies, procedures, and timing across relevant federal funding mechanisms?
- ▶ encourage governance mechanisms that foster coordination and integrated decision making within and across levels of government?
- ▶ promote better understanding and awareness of the interactions among infrastructure components and ecosystems in disaster resilience actions?
- ▶ facilitate planning across jurisdictions and sectors to avoid or respond to cascading failure?



## Integration

Integrated analysis and planning can help decision makers take coherent and coordinated resilience actions.

# Incentives

To what extent could federal efforts:

- ▶ make risk-reduction measures more viable and attractive?
- ▶ incorporate disaster risk-reduction measures in infrastructure and ecosystem management financial assistance?
- ▶ require disaster risk-reduction measures for government-owned or -operated infrastructure and for federally-funded projects?
- ▶ alleviate unnecessary administrative burden?
- ▶ streamline review processes?
- ▶ improve program design to motivate risk-reduction actions?



## Incentives

Incentives can help to make long-term, forward-looking risk-reduction investments more viable and attractive among competing priorities.



# Monitoring & Evaluation Recommendations

- with a high need and finite funding for hazard mitigation, collecting and sharing information on project cost-effectiveness is crucial to help FEMA, state, and local governments make better-informed mitigation investment decisions (GAO-21-140)
  - should develop a plan for conducting future loss avoidance studies to ensure they can include more hazard types
  - ensure that as new methods and metrics to assess the effectiveness of hazard mitigation are developed, FEMA considers opportunities to adopt common methods and metrics across all of its hazard mitigation programs
  - should publicly share pre-calculated benefits studies and state developed records of effectiveness

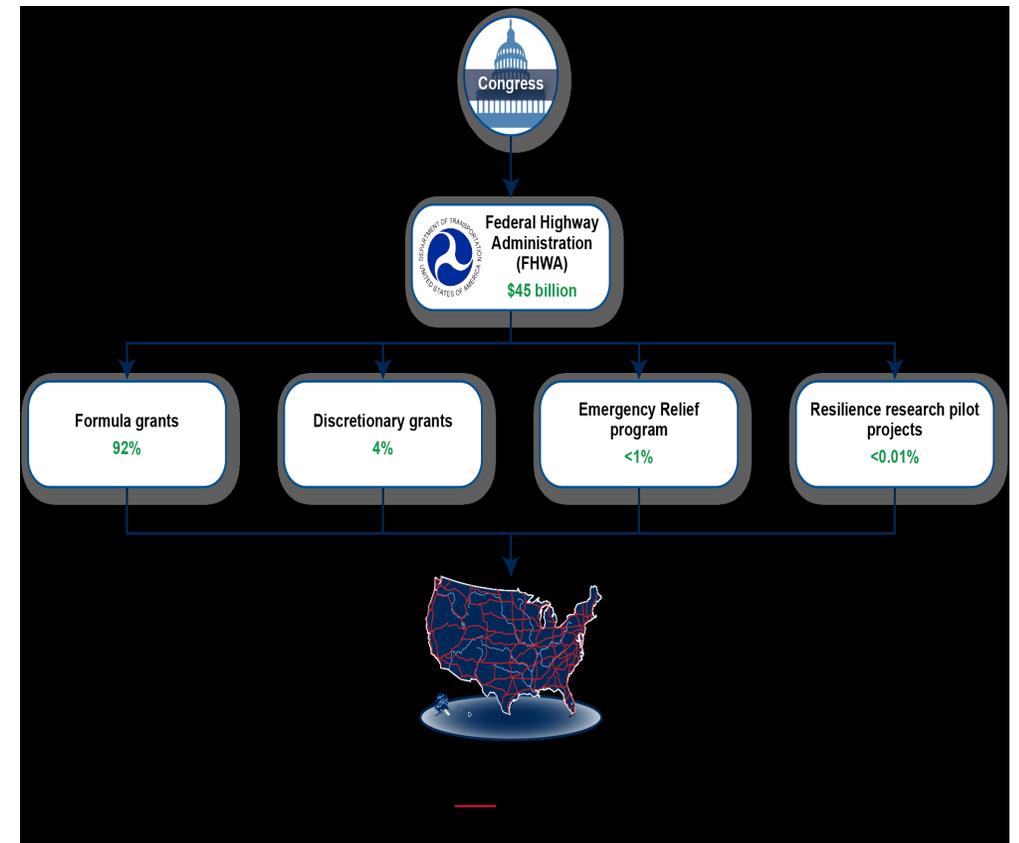
# Climate Resilience: Options to Enhance the Resilience of Federally Funded Roads and Reduce Fiscal Exposure

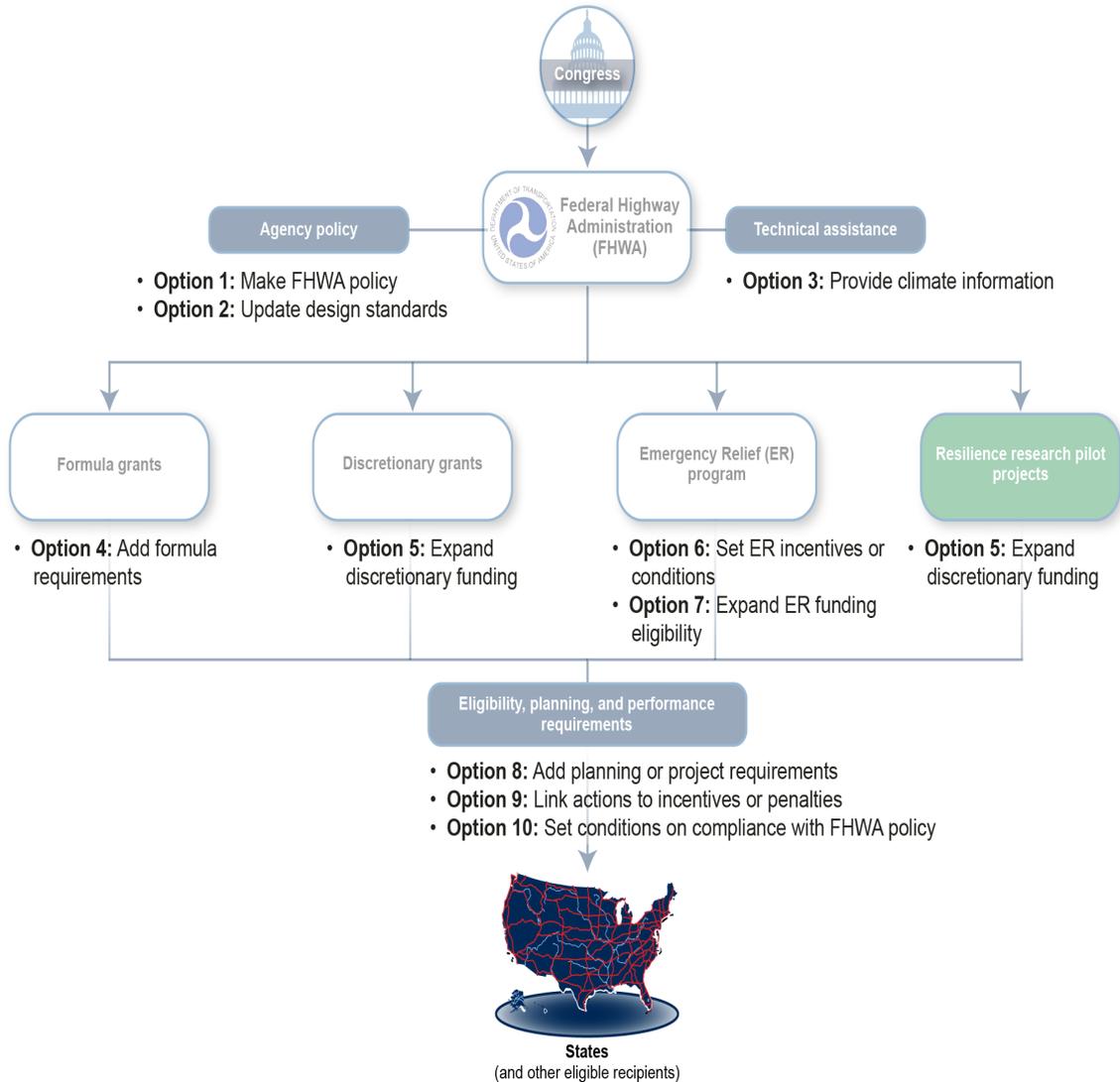
([GAO-21-436](#), 9/22/21)

## Objectives.

1. What efforts has FHWA made to enhance the climate resilience of federally funded roads during the past 10 years?
2. What are the strengths and limitations of options to further enhance the climate resilience of federally funded roads, according to knowledgeable stakeholders and relevant literature?

2(a) We also provide information on how we used GAO's *Disaster Resilience Framework* to evaluate the extent to which each of the options identified in this report could enhance the climate resilience of federally funded roads.





**Table 2: Strengths and Limitations of Options to Further Enhance the Climate Resilience of Federally Funded Roads**

Option	Strengths	Limitations
<b>Option 1: Make Federal Highway Administration (FHWA) policy</b>		
Integrate climate resilience into FHWA policy and guidance. <sup>a</sup>	<ul style="list-style-type: none"> <li>National policy can motivate action</li> <li>Clearly communicates FHWA priorities and expectations</li> </ul>	<ul style="list-style-type: none"> <li>Potential lack of long-term consistency and implementation</li> <li>May not reflect varying state capacities or risks</li> </ul>
<b>Option 2: Update design standards</b>		
Update design standards to account for climate change and resilience best practices. <sup>a</sup>	<ul style="list-style-type: none"> <li>Updated codes, design standards, and related guidance can lead to broad uptake of best practices for climate resilience</li> <li>Removes information barrier to action</li> </ul>	<ul style="list-style-type: none"> <li>Depends on actions by non-governmental partners</li> <li>May be a slow process</li> </ul>
<b>Option 3: Provide climate information</b>		
Provide authoritative, actionable, forward-looking climate information. <sup>a</sup>	<ul style="list-style-type: none"> <li>Facilitates informed decision-making</li> <li>Removes information barrier to action</li> </ul>	<ul style="list-style-type: none"> <li>Does not motivate or compel action</li> <li>Depends on actions by other federal entities</li> </ul>
<b>Option 4: Add formula requirements</b>		
Add climate resilience funding requirements, conditions, or criteria to formula funds. <sup>b</sup>	<ul style="list-style-type: none"> <li>Compels action</li> <li>Mainstreams resilience into the majority of funding</li> <li>Distributes resilience funding broadly</li> </ul>	<ul style="list-style-type: none"> <li>Limits state flexibility and autonomy</li> <li>May not reflect varying state capacities or risks</li> <li>Formula funds may not address vulnerable roads that have many years left in their design life</li> </ul>
<b>Option 5: Expand discretionary funding</b>		
Expand the availability of discretionary funding for climate resilience improvements. <sup>a</sup>	<ul style="list-style-type: none"> <li>Does not divert funding from other projects or create mandates</li> <li>Can support innovation through, for example, pilot programs or best practices research</li> <li>Could be used to target specific types of projects or areas of need</li> <li>Allows FHWA to define national priorities and expectations</li> </ul>	<ul style="list-style-type: none"> <li>Does not mainstream resilience or move it into standard practice</li> <li>Limits state flexibility and autonomy because FHWA decides what to prioritize</li> <li>May mismatch funding with risk because ability to write grants is not correlated with need</li> <li>May support politically influenced rather than broadly useful projects</li> <li>Creates administrative burdens for FHWA and states requesting funding</li> <li>May present transparency issues, given known challenges with discretionary grant programs</li> </ul>
<b>Option 6: Set Emergency Relief (ER) incentives or conditions</b>		
Alter the ER program by providing incentives for, or conditioning funding on, pre-disaster resilience actions. <sup>b</sup>	<ul style="list-style-type: none"> <li>Incentivizes proactive approach in potential disaster areas</li> <li>Could incentivize states that haven't previously acted to invest in resilience</li> </ul>	<ul style="list-style-type: none"> <li>May not address resilience across the system of transportation assets and services</li> <li>Conditions may be waived when disasters hit</li> <li>Presents equity issues if ER funding is conditional rather than need-based</li> <li>May present monitoring challenges, given known issues with the ER program</li> </ul>



Figure 9: Using GAO's Disaster Resilience Framework to Show How the Options We Identified That Relate to Information Could Enhance the Climate Resilience of Federally Funded Roads

**Principle**  
**Information**  
 Assessing information that is available and understanding current and future risk and the impact of risk reduction strategies.

**Provide reliable and authoritative information about current and future risk**

- To what extent could federal efforts:
  - Enhance the quality and quantity of the disaster risk information available?
  - Provide and share additional information that would help decision makers understand the disaster risk?

**Reduce the complexity of and translate risk information for nontechnical audiences?**

- To what extent could federal efforts:
  - Help decision makers identify and better understand the disaster risk reduction alternatives?
  - Provide technical assistance to help build capacity of nontechnical audiences?
  - Develop an understanding of approaches for reducing complexity of disaster risk information, such as decision makers, clearly and concisely identify funding needs and alternatives for making disaster risk reduction decisions?
  - Strengthen the ability to assess status and report progress?

Information subprinciple: provide reliable and authoritative information about current and future risk		
Option to improve the climate resilience of federally funded roads	Federal Highway Administration's (FHWA) climate resilience effort(s)	<b>Question for Consideration:</b> To what extent could the additional option reduce the complexity of and translate risk information for nontechnical audiences?
Option 3: Provide climate information.	Providing technical assistance and funding resilience research	To some extent, FHWA has provided technical assistance and funded resilience research to reduce the complexity of risk information. Providing authoritative climate information on topics that stakeholders said could help them make resilience decisions, such as how to select among climate change scenarios, could further reduce the complexity of risk information. However, this issue is larger than FHWA, as GAO previously recommended that the federal government provide authoritative climate information at a government-wide scale. <sup>a</sup>
Option 2: Update design standards.	Providing technical assistance	To some extent, FHWA has developed some design guidance to reduce the complexity of risk information. Working with standards-setting organizations to update design standards to account for climate change and resilience best practices could further reduce the complexity of risk information. However, GAO has reported that this is a government-wide problem. <sup>b</sup>

Sources: GAO's Disaster Resilience Framework (GAO-20-100BP) and GAO analysis of FHWA documents, relevant literature, and interviews with knowledgeable stakeholders. | GAO-21-436

<sup>a</sup>GAO, *Climate Information: A National System Could Help Federal, State, Local, and Private Sector Decision Makers Use Climate Information*, GAO-16-37 (Washington, D.C.: Nov. 23, 2015).

<sup>b</sup>GAO, *Climate Change: Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications*, GAO-17-3 (Washington, D.C.: Nov. 30, 2016).



# What is Possible, *HOW* Can Agencies Enhance Climate Resilience?

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## Matter for Congressional Consideration

As Congress considers reauthorizing legislation for the federal-aid highway program, it should consider providing direction or authority to the Federal Highway Administration to implement one or more of the options to enhance the climate resilience of federally funded roads identified in this report. ( Matter 1)

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## Recommendation for Executive Action

The Secretary of the U.S. Department of Transportation should consider how the Federal Highway Administration (FHWA) plans to implement options to enhance the climate resilience of federally funded roads, such as the options identified in this report, when prioritizing actions on climate change in policy-making, as called for in Executive Order 14008. (Recommendation 1)



# Selected Current Events

- Infrastructure Investment and Jobs Act
- Executive orders [14008](#), [14030](#), and [14057](#)
  - Agency Climate Adaptation and Resilience Plans, etc.
- March 8 GAO testimony before the House Committee on Science, Space and Technology
  - [Federal Climate Adaptation and Resilience for the 21<sup>st</sup> Century](#)
  - Climate Resilience: Opportunities to Improve Federal Planning and Implementation ([GAO-22-105688](#), 3/8/22)
- GAO has 11 climate resilience engagements underway
  - Almost all of them apply the Disaster Resilience Framework in some way.
  - Specifically, two engagements on climate resilient agriculture and climate resilient Army Corps flood risk management infrastructure.

# Resources

- *Disaster Resilience Framework: Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters* ([GAO-20-100SP, Oct. 23, 2019](#))
- High Risk: [Limiting the Federal Government's Fiscal Exposure By Better Managing Climate Change Risks](#) (GAO-21-119SP, March 2, 2021)
- Climate Resilience: Opportunities to Improve Federal Planning and Implementation ([GAO-22-105688](#), 3/8/22)
- WatchBlog Post: [Our New Disaster Resilience Framework](#)

# Questions?



Contact Kathryn Godfrey ([godfreyk@gao.gov](mailto:godfreyk@gao.gov)) or Joe Thompson ([thompsonjd@gao.gov](mailto:thompsonjd@gao.gov)) with plaudits, comments, and questions.