



U.S. DEPARTMENT OF  
TRANSPORTATION

**Federal Highway  
Administration**

# Order

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**Subject: Transportation System Preparedness and  
Resilience to Climate Change and Extreme Weather  
Events**

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Classification Code	Date	Office of Primary Interest
5520	December 15, 2014	HEP/HIF/FLH

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Par.

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1. **What is the purpose of this directive?** The purpose of this directive is to establish the Federal Highway Administration (FHWA) policy on preparedness and resilience to climate change and extreme weather events. This directive further serves to implement relevant provisions of title 23 of the United States Code (U.S.C), to comply with Executive Order 13653, Preparing the United States for the Impacts of Climate Change (EO 13653), dated November 1, 2013, and further the U.S. Department of Transportation (DOT) Policy Statement on Climate Change Adaptation.

2. **Does this directive cancel an existing FHWA directive?** No. This is a new FHWA directive.

3. **What is the background of this directive?**

- a. Climate change and extreme weather events present significant and growing risks to the safety, reliability, effectiveness, and sustainability of the Nation's transportation infrastructure and operations.
- b. The impacts of a changing climate (such as higher temperatures, sea-level rise, and changes in seasonal precipitation and the intensity of rain events) and extreme weather events are affecting the lifecycle of transportation systems and are expected to intensify. For example, sea level rise coupled with storm surges can inundate coastal roads that would not have inundated in the past, necessitate more emergency evacuations, and require costly, and sometimes

recurring, repairs to damaged infrastructure. Inland flooding from unusually heavy downpours can disrupt traffic, damage culverts, and reduce service life. High heat can degrade materials, resulting in shorter replacement cycles and higher maintenance costs.

- c. While transportation infrastructure is designed to handle a broad range of impacts based on historic climate, preparing for climate change and extreme weather events is critical to protecting the integrity of the transportation system and the sound investment of taxpayer dollars.

#### **4. What authorities govern this directive?**

- a. 23 U.S.C. § 109. Federally funded highway restoration, rehabilitation or resurfacing projects shall be done in such a way as to "preserve and extend the service life of highways and enhance highway safety." Designs for new or reconstructed facilities on the National Highway System may account for the "constructed and natural environment of the area."
- b. 23 U.S.C. § 116. Preventive maintenance is a "cost-effective means of extending the useful life of a Federal-aid highway."
- c. 23 U.S.C. § 119(d)(2)(B) and (C). Allows FHWA to provide Federal aid funds for "... construction, replacement ..., rehabilitation, preservation, and protection (including ... protection against extreme events) of bridges on the National Highway System" and "... construction, replacement ..., rehabilitation, preservation, and protection (including ... protection against extreme events) of tunnels on the National Highway System."
- d. 23 U.S.C. § 133(b)(2). Allows FHWA to provide Federal-aid funds for "... replacement ..., rehabilitation, preservation, protection (including ... protection against extreme events) ... of bridges (and approaches to bridges and other elevated structures) and tunnels on public roads of all functional classifications, including any such construction or reconstruction necessary to accommodate other transportation modes."
- e. 23 U.S.C. § 134 (a)(1). States that "It is in the national interest... to encourage and promote the safe and efficient management, operation, and development of surface transportation systems...within and between States and urbanized areas..."
- f. 23 U.S.C. § 150(b). Identifies that it is a national transportation goal to maintain the highway infrastructure in a state of good repair (Infrastructure Condition) and improve the efficiency of the surface transportation system (System Reliability).
- g. 23 U.S.C. § 503(b)(3)(B)(viii). Requires that "...the Secretary shall carry out research and development activities ... to study vulnerabilities of the transportation system to ... extreme events and methods to reduce those vulnerabilities."

- h. Executive Order (EO) 13653, Preparing the United States for the Impacts of Climate Change (EO 13653), dated November 1, 2013. Requires Federal agencies to prepare the Nation for the impacts of climate change by undertaking actions to enhance climate preparedness and resilience. In doing so, agencies should promote: (1) engaged and strong partnerships and information sharing at all levels of government; (2) risk-informed decision making and the tools to facilitate it, (3) adaptive learning, in which experiences serve as opportunities to inform and adjust future actions, and (4) preparedness planning.
- i. Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (EO 13514), dated October 5, 2009. Requires Federal agencies to develop Agency Adaptation Plans and submit them to the Council on Environmental Quality and Office of Management and Budget for review. These plans are to evaluate the most significant climate change related risks to, and vulnerabilities in, agency operations and missions in both the short and long term, and outline actions that agencies will take to manage these risks and vulnerabilities.
- j. U.S. DOT Policy Statement on Climate Change Adaptation, Provides guiding principles on climate change adaptation.

5. **What is the scope of this directive?** This Order applies to FHWA's programs, policies, and activities related to preparedness and resilience to climate change and extreme weather events (see paragraph 6. Definitions, a through f).

6. **What definitions are used in this directive?**

- a. **Climate Change.** Climate change refers to any significant change in the measures of climate lasting for an extended period of time. Climate change includes major variations in temperature, precipitation, or wind patterns, among other environmental conditions, that occur over several decades or longer. Changes in climate may manifest as a rise in sea level, as well as increase the frequency and magnitude of extreme weather events now and in the future.
- b. **Extreme Weather Events.** Extreme weather events can include significant anomalies in temperature, precipitation and winds and can manifest as heavy precipitation and flooding, heatwaves, drought, wildfires and windstorms (including tornadoes and tropical storms). Consequences of extreme weather events can include safety concerns, damage, destruction, and/or economic loss. Climate change can also cause or influence extreme weather events.
- c. **Extreme Events.** For the purposes of this directive, the term "extreme events" refers to risks posed by climate change and extreme weather events. The definition does not apply to other uses of the term nor include consideration of risks to the transportation system from other natural hazards, accidents, or other human induced disruptions.<sup>1</sup>

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<sup>1</sup> Provisions in 23 U.S.C. §§ 119(d)(2)(B) and (C), 133(b)(2), and 503(b)(3)(B)(viii) address extreme events separately from

- d. **Preparedness.** Preparedness means actions taken to plan, organize, equip, train, and exercise to build, apply, and sustain the capabilities necessary to prevent, protect against, ameliorate the effects of, respond to, and recover from climate change related damages to life, health, property, livelihoods, ecosystems, and national security.
- e. **Resilience.** Resilience or resiliency is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.
- f. **Adaptation.** Adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.

7. **What is the FHWA's policy concerning climate change and extreme weather event preparedness and resilience?**

- a. It is FHWA's policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies and programs in order to promote preparedness and resilience; safeguard Federal investments; and ensure the safety, reliability, and sustainability of the Nation's transportation systems.
- b. Several provisions in title 23 address the need to consider the effects of extreme events in the delivery of programs and projects (23 U.S.C. §§ 119(d)(2)(B) and (C), 133(b)(2), and 503(b)(3)(B)(viii)). Under EO 13653, each Federal agency must work to prepare the Nation for the impacts of climate change by undertaking actions to enhance climate preparedness and resilience. The FHWA will implement these relevant provisions in title 23, EO 13653, EO 13514, and subsequent laws, regulations and policies. The FHWA will also implement the principles of the DOT Policy Statement on Climate Change Adaptation by incorporating consideration of climate change and extreme weather event preparedness and resilience in all FHWA programs, policies, and activities within the framework of existing laws, regulations, and guidance.
- c. Following the policy set forth in this directive, FHWA managers and staff shall ensure that FHWA programs, policies, and activities for which they are responsible integrate consideration of climate change and extreme weather event impacts and adaptation into its planning, operations, policies and programs, in order to promote climate change and extreme weather event preparedness and resilience. Proactive management involves developing engineering solutions, operations and maintenance strategies, asset management plans and transportation programs that address risk and promote resilience at both the project and systems levels.

- 8. What are the FHWA's responsibilities?** The FHWA will integrate consideration of the risks of climate change and extreme weather event impacts and adaptation responses, into the delivery and stewardship of the Federal-aid and Federal Lands Highway programs by:
- a. Identifying and removing administrative, regulatory, and policy barriers that discourage climate change and extreme weather event preparedness and resiliency or unintentionally increase the vulnerability of transportation systems to these risks.
  - b. Encouraging State departments of transportation (DOT), metropolitan planning organizations (MPO), Federal land management agencies (FLMAs), tribal governments, and others to develop, prioritize, implement and evaluate risk-based and cost-effective strategies to minimize climate and extreme weather risks and protect critical infrastructure using the best available science, technology and information.
  - c. Developing and providing technical assistance, research, and outreach, and encouraging the development and use of transportation-specific vulnerability assessment and adaptation tools.
  - d. Clarifying and informing State DOTs, MPOs, FLMAs, tribal governments, and others of existing funding eligibilities to support resiliency and adaptation in the delivery of title 23 programs.
  - e. Developing research and tools, providing technical assistance, and building partnerships with State DOTs and MPOs, particularly in development and analysis of adaptation, preparedness, and resiliency options.
  - f. Encouraging the consideration of climate change and extreme weather event risks, preparedness and resiliency in the delivery of programs, such as in the risk-based asset management plans State DOTs are required to develop under MAP-21.
  - g. Updating planning, engineering, and operations guidance to include consideration of climate change and extreme weather event resilience.
  - h. Reporting on progress through the US DOT Adaptation Plan and internal FHWA strategic planning activities.

9. **Where can I obtain additional guidance?** For more information or additional guidance related to climate change and extreme weather event preparedness and resilience, please see the FHWA Climate Change [web site](#).



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