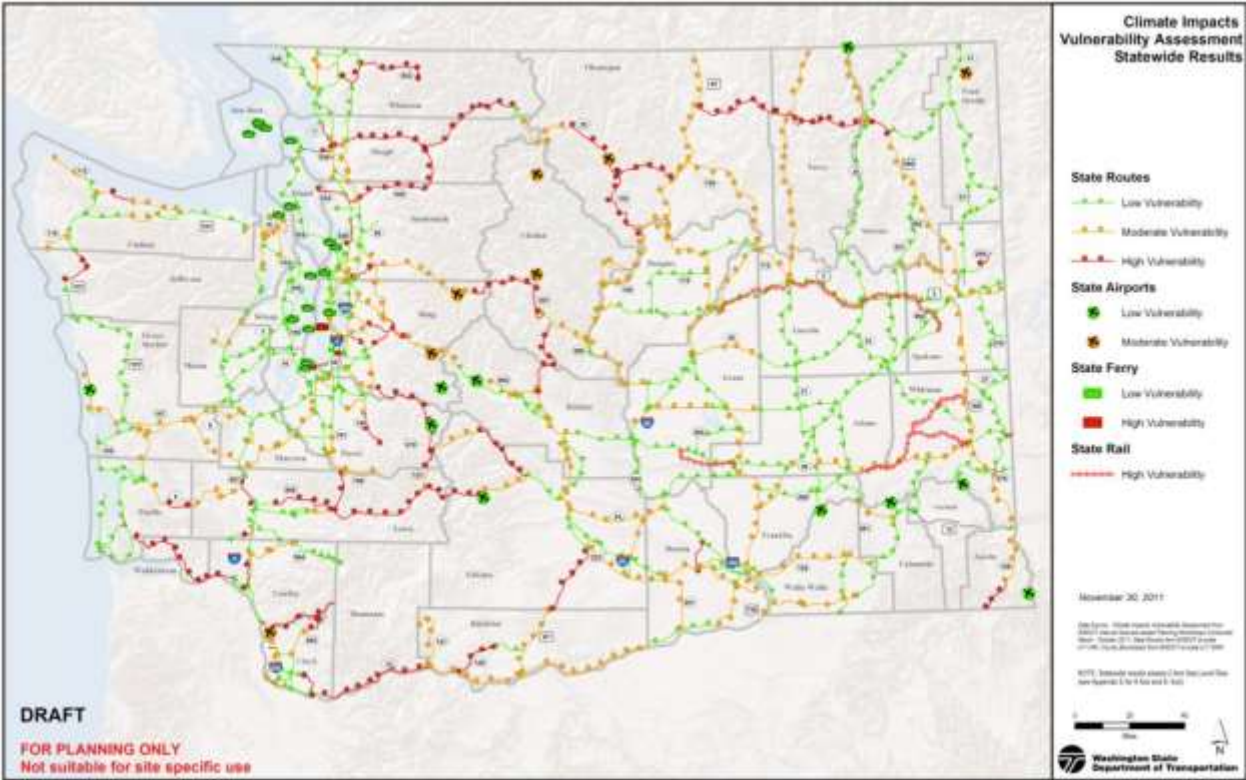


Guidance for NEPA and SEPA Project-Level Climate Change Evaluations



Contact:

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Environmental Services Office
March 2022 Update

Introduction to the 2022 Version

WSDOT's Environmental Services Office developed the first version of this guidance in 2009 to answer the question: ***How should we address greenhouse gas (GHG) emissions and climate change in our environmental documents?*** We became the first DOT in the nation to consistently incorporate GHG and climate change into our cumulative effects analysis under National and State Environmental Policy Acts (NEPA and SEPA).

This 2022 update is consistent with the Council on Environmental Quality's (CEQ) final guidance for Federal agencies on how to consider the impacts of their actions on global climate change in their National Environmental Policy Act (NEPA) reviews (August 2016). Pursuant to President Biden's Executive Order (E.O.) 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, CEQ is currently reviewing and updating the 2016 guidance.

Regarding the connection between environmental justice and climate change, this updated guidance directs project teams to examine whether a proposed project's effects on environmental resources and vulnerable populations will be exacerbated by climate change related vulnerability. This is consistent with WSDOT's emphasis on inclusive community engagement and environmental justice throughout project delivery. It is also consistent with WSDOT's implementation of RCW 70A.02, known as the Healthy Environment for All (HEAL) Act.

Please note: WSDOT's Project-Level guidance for GHG evaluations is contained within the air quality guidance. The reason for this is that they rely on similar inputs and tools. See *Guidance on Addressing Air Quality, Greenhouse Gas, and Energy for WSDOT Projects* on the WSDOT Energy webpage at: [Air quality, noise & energy | WSDOT \(wa.gov\)](#)

This document, *Guidance for Project-Level Climate Change Evaluations for NEPA and SEPA*, is available on the WSDOT climate adaptation webpage at: <https://wsdot.wa.gov/engineering-standards/environmental-guidance/cumulative-impacts-including-climate-resiliency>

Guidance

WSDOT prepares environmental documents in compliance with NEPA and SEPA to provide information that is useful for the public and decision makers. WSDOT serves as the SEPA lead agency for our proposed actions, and as the project proponent and/or joint NEPA lead with federal transportation agencies. This guidance explains how WSDOT’s NEPA/SEPA environmental review documents should consider projected climate change. This guidance is used for all WSDOT Environmental Assessment (EA) and Environmental Impact Statement (EIS) level projects. However, it may also be used for Categorical Exclusion (CE) level projects in areas with medium or high vulnerability to climate change impacts (this is not required).

The University of Washington’s [Climate Impacts Group](#) develops state-specific climate change information. See their [Climate impacts in brief](#) webpage for a summary of anticipated climate changes in the Pacific Northwest. Federal agencies also provide information on historic climate trends and forecasted climate, for example, the U.S. Army Corps of Engineers (USACE) sea-level rise calculator, and the National Oceanic and Atmospheric Administration (NOAA) Climate Explorer. There may also be other sources for localized climate change and projection information in your project area. See climate resources including tools, data, and reports on page 7 of this guidance.

The following table was created with the assistance of the UW Climate Impacts Group to illustrate some potential impacts of particular concern to transportation infrastructure.

<i>Projected Climate Change</i>	<i>Potential Impacts on State Highways, Rail, and Ferries</i>
<ul style="list-style-type: none"> • Increase in average winter precipitation and more extreme precipitation • Change in timing of precipitation (more rain, less snow) • Change in storm track with some extreme storms with higher-than-normal snow accumulation 	<ul style="list-style-type: none"> • More rock fall, mudslides, sink holes, roadbed failure • Increased large-scale river flooding • More localized flooding due to poor drainage or higher groundwater table • Severe wind-related road closures • Blown-down trees, signs • Less snow removal, on average (some extreme snows)
<ul style="list-style-type: none"> • Sea-level rise, higher storm surge • More frequent and extensive inundation of low-lying areas (both temporary and permanent) 	<ul style="list-style-type: none"> • Coastal erosion and landslides weaken roadbed and bridge footings • Damage to stormwater drainage and tide gates • Saltwater corrosion of facilities • Detours around frequently flooded coastlines
<ul style="list-style-type: none"> • Higher average temperatures • Increase in extreme heat events (heat waves) • Drought and low stream and ground water flow • Wildfire or extreme fire risk 	<ul style="list-style-type: none"> • Adverse impacts on pavement and rail (buckling) • Loss of roadside vegetation (leading to erosion and landslides) • Increased noxious weeds, invasive plants • Wetland mitigation site failure

WSDOT often references the [Washington Climate Change Impacts Assessment](#) (University of Washington, June 2009; updated 2013). It provides sufficient information to enable planning-level consideration of our state's forecasted climate impacts but is not sufficient for site specific designs. In 2011, WSDOT completed the *Climate Impacts Vulnerability Assessment* (CIVA) to assist project teams and transportation planners (more CIVA information below).

This guidance outlines a standard analytical process and provides template language with the agency's key messages. The guidance is consistent with the technical and policy guidance contained in WSDOT's *Environmental Manual* Chapter 412 (cumulative effects).

Who should use this guidance?

All WSDOT projects subject to NEPA and SEPA are required to follow this guidance. The guidance is written to be used by WSDOT staff. Compliance with this guidance does not require outside expertise or consultant support. Please keep the following in mind:

- The Environmental Services Office NEPA/SEPA Program is available to help project teams use this guidance and to answer questions about climate impacts as they relate to our analysis of proposed actions under NEPA and SEPA.
- This guidance satisfies WSDOT's responsibilities for disclosure related to the NEPA and SEPA processes.
- This guidance does not apply to documents prepared to satisfy the federal Endangered Species Act. Refer to the Biological Assessment preparation [manual](#).

What is WSDOT's *Climate Impacts Vulnerability Assessment* (CIVA), and is it still relevant?

Yes! Twelve years since it was published, the CIVA is still a useful starting place for projects and plans. The climate projections have not significantly changed since the assessment was completed.

WSDOT's Climate Impacts Vulnerability Assessment is a qualitative assessment of risks to our infrastructure from climate change. In 2010 and 2011, WSDOT collected an inventory of department-owned assets and climate change data using GIS. University of Washington climate scientists provided us with climate data.

Key points about the CIVA:

- WSDOT leveraged its years of project risk management experience through its signature Cost Estimate Validation Process® and Cost Risk Assessment Workshops to develop an appropriate risk assessment method for the climate change analysis.
- Fourteen workshops engaged experts across all regions, state ferries, rail, and aviation.
- The outcome of each workshop was a **qualitative assessment** of infrastructure vulnerability agreed upon by participants.

- Participants assessed roadways, and WSDOT-owned ferry, rail, and airport facilities. Each asset was rated high, medium, or low vulnerability.
- Roadways were divided into segments ranging in length from less than 1 mile to around 100 miles (in Eastern WA). The average segment length is approximately 14 miles.

Roadway vulnerability ratings are publicly available on the Washington Geospatial Open Data [Portal](#). Vulnerability ratings for the other assets are available internally on WSDOT's GIS Workbench.

In the statewide map (on cover), red shows high likelihood of vulnerability, yellow denotes roads that could experience temporary operational failures at one or more locations, and green indicates roads that could experience reduced capacity somewhere along that roadway segment. Note that roadway segments shown as having a high impact (red) may not be vulnerable for the whole segment—rather one or two areas along that segment may be vulnerable to catastrophic failure. The accuracy of the vulnerability ratings is suitable for planning purposes.

In general, areas shown with locations having a high impact are:

- In the mountains.
- Above or below steep slopes.
- In low-lying areas subject to flooding.
- Along rivers that are aggrading due to glaciers melting.
- In low-lying coastal areas subject to inundation from sea-level rise.

The CIVA is the starting place for Project-Level NEPA discussion of climate change. Project teams and planners should consider the information in the vulnerability assessment in addition to examining existing conditions and other identified risks (such as unstable slopes, seismic, fire, tsunami).

NEPA is not the only stage where the CIVA results are used. WSDOT is committed to the consideration of climate change as part of the long-term management of state transportation assets. Climate and extreme weather preparedness are considered in all program areas, as shown below.

Planning: Major emphasis in our strategic plan: Consider climate change and propose ways to improve resilience (corridor studies and plans).

Design & Environmental Review: Evaluate potential risks during the environmental and design phase. Project teams follow WSDOT's NEPA /SEPA guidance (2008 to present) [NEPA & SEPA](#).

Construction: Look at potential for new issues: Saltwater corrosion, heat, or precipitation changes for long-term impacts on materials.

Maintenance & Operations: Multi-hazard risk reduction, awareness of maintenance

activities that may be affected by heat or extreme weather events.

How should NEPA/SEPA projects consider future conditions related to climate change?

WSDOT project teams are expected to examine available information about climate trends and use the results of WSDOT's assessment of vulnerable infrastructure (as outlined in this guidance). By doing so, project teams can get a better understanding of how to make their proposed projects more resilient to future climate impacts and severe storm events.

WSDOT also expects its NEPA specialists and technical experts to understand that climate science changes how we describe the "affected environment" in NEPA. That means that project teams need to examine the future affected environment and not just rely on what we know from the past.

Past trends for a specific resource (water, habitat, air) may not be accurate predictions for the future. Instead, we need to look at scientifically based projections of the changing climate as part of our analysis. Our approach to wetland mitigation provides a clear example: WSDOT teams are looking at future issues that may impact the success of environmental mitigation (like saltwater inundation or drought as concerns for long-term wetland viability).

Project teams are expected to ask and answer these questions, **"how will my project be affected by climate change? What are ways to increase the resilience of the transportation assets in the project area?"**

Follow these steps:

1. Examine the results of WSDOT's 2011 *Climate Impacts Vulnerability Assessment (CIVA)* for your project area. This information will alert you to potential vulnerabilities and/or strengths in the existing WSDOT facilities. (The report is available online at: [Climate Impacts Vulnerability Assessment Report \(wa.gov\)](#)).
2. Examine local and regional climate data. Project teams should determine whether there is regional or site-specific climate information that would be useful or applicable to their project's resilience and the analysis of project-related impacts and mitigation. See list of regional, state, and federal climate information sources below.
3. Assess impacts. Direct project technical specialists to consider the available climate change information (steps 1 and 2) in their NEPA and SEPA analysis, including the future climate conditions as they relate to success of suggested mitigation of project impacts. Specialists should consider and document their findings as to whether climate change will exacerbate the effects of the proposed project on:
 - i. Vulnerable populations and overburdened communities as defined in RCW 70A.02; and
 - ii. Environmental resources including cultural resources, fish and wildlife habitat, and others as appropriate.

4. Document findings in the NEPA EA or EIS. Document how the project will be designed to be resilient or resistant to climate threats (such as the use of drilled shafts or site selection to avoid a potential threat). Include consideration of ways to address vulnerability of Environmental Justice populations, transit-dependent populations, or residents with special transportation needs. Often the most logical place for this discussion is the cumulative effects section.

How do I find relevant climate data?

Steps 1 and 2 (above) are your starting place.

Step 1 requires project teams to look at the WSDOT GIS layer titled: “CIVA - Climate Vulnerability Assessment” available through the GIS Workbench, under the Environmental Business Area. The data contains the results of the statewide qualitative assessment. The internal GIS layer also has the comments from the workshops about the climate threats that lead to the ratings. The information is very easy to access and provides a useful starting place for project teams.

Step 2 requires a check for new regional or site-specific climate information that would be useful or applicable. We recommend this because new information on actual weather events (like stream gage data) and new outputs from climate model results may be available in your project area. WSDOT Environmental Services Office and Hydraulics Office staff can help project teams locate the best available information.

LINKS TO CLIMATE INFO

Resources provided by the University of WA [Climate Impacts Group](#) include:

- [Datasets](#): The Climate Impacts Group [produces hydro-climatic data](#) at various spatial scales for historical and projected conditions in the Pacific Northwest and beyond. These data are available free of charge for use in research and planning. We also utilize [other datasets](#) produced at regional, national, and international institutions in our work, and have included many of those here.
- [Analysis Tools](#): Analysis tools produced by the Climate Impacts Group are designed to help users visualize and interpret climate data.
- [Publications](#): With more than 700 publications on climate variability and change, climate impacts, and adaptation, the Climate Impacts Group publications library serves as a comprehensive resource for those interested in learning more about specific issues.
- [Special Reports](#): The Climate Impacts Group regularly produces or contributes to special reports on regional climate impacts and adaptation. This includes our “State of Knowledge” syntheses, guidebooks, and other unique resources relevant to a wide range of users.

Washington State Department of Health's - Washington Tracking Network:

- [Climate and Health](#) – mapping tools to display localized climate data and climate change projections.

Puget Sound Regional Council:

- [Interactive hazards web map](#) – shows which areas of King, Kitsap, Pierce, and Snohomish counties are vulnerable to various hazards including sea level rise, flood, wildfire, landslide, and more.

Federal Information:

- NOAA State Climate Summaries: <https://statesummaries.ncics.org/>
- Fourth National Climate Assessment: <https://nca2018.globalchange.gov/>
- NOAA's Data Tools: <https://www.ncdc.noaa.gov/cag/county/time-series>
- NOAA Climate Explorer: <https://crt-climate-explorer.nemac.org/>
- Sea Level Trends [Sea Level Trends - NOAA Tides & Currents](#)

USACE [Sea Level Change Curve Calculator](#) tool reports predicted sea level change for three scenarios from 1992 forward. Select the NOAA tide gage closest to your location of interest to view a detailed report.

FHWA Resources and Technical Guidance:

- FHWA's [Sustainability and Resilience website](#)
- [HEC-17: Hydraulic Engineering Circular 17: Highways in the River Environment - Floodplains, Extreme Events, Risk, and Resilience](#)
- [Hydraulic Engineering Circular No. 25 - 3rd Edition: Highways in the Coastal Environment](#) (January 2020)
- FHWA Climate Change Adaptation Guide for [Transportation Systems Management, Operations, and Maintenance](#)

Is there template language that project teams may use in WSDOT documents?

This guidance provides template language for EAs and EISs below. Currently, the ERS (scoping) and ECS (CE documentation) forms do not contain a section for documenting climate change considerations. However, you may attach a memo to the ECS form for CE-level projects in areas with medium or high vulnerability to climate change impacts (this is not required).

For smaller projects, the design of the proposed project should consider appropriate and available data on climate change and extreme weather events. Designers should follow the direction of the federal lead agency. WSDOT's technical guidance is in the [Hydraulics Manual](#)

(for water crossings and fish passage), and the [WSF Terminal Design Manual](#). Other manuals will be updated in the future.

Key messages are contained in the templates below. Suggested EA/EIS template language should be tailored to the project specifics.

How did the Project Team consider climate change?

WSDOT acknowledges that the effects of climate change may alter the function, sizing, and operation of our facilities. To ensure our facilities can function as intended for their planned 50-, 70-, or 100-year lifespan, they should be designed to perform under the variable conditions expected as a result of climate change. For example, drainage culverts may need to be resized to accommodate more intense rainfall events or increased flows due to more rapid glacial thawing.

The Pacific NW climate projections are available from the Climate Impacts Group at the University of Washington: <http://cses.washington.edu/cig/fpt/ccscenarios.shtml>.

Washington State is likely to experience the following over the next 50 years:

- Increased temperature (extreme heat events, changes in air quality, glacial melting).
- Changes in volume and timing of precipitation (reduced snowpack, increased erosion, flooding).
- Ecological effects of a changing climate (spread of disease, altered plant and animal habitats, negative impacts on human health and well-being).
- Sea-level rise, coastal erosion, saltwater intrusion.

The project team considered the information on climate change with regard to preliminary design as well as the potential for changes in the surrounding natural environment.

The project is designed to last (30, 50, 70 Years) years. As part of its standard design, this project has incorporated features that will provide greater resilience and function with the potential effects brought on by climate change. (Describe the features such as stormwater flow control, bridge height or design, ...)

What state policy or directives support this guidance?

WSDOT's vision is to be the best at providing a sustainable and integrated multimodal transportation system. Sustainability is one of WSDOT's core values. In 2022, WSDOT is updating its strategic plan to include resilience. Climate consideration is part of our asset management approach as well as part of our implementation of practical solutions.

The following strategic directives support our role in building a resilient transportation network for the future:

Results Washington

Governor Inslee's [Results Washington](#) includes indicators of success for five goal areas. WSDOT is directly responsible for indicators related to clean transportation and sustainable and efficient infrastructure. WSDOT also contributes to other goals such as quality of life, vibrant communities, clean and restored habitat, and healthy air and water.



Executive Order 14-04

The Governor's [Executive Order 14-04](#), "Washington Carbon Pollution Reduction and Clean Energy Action," directs state agencies to reduce carbon emissions and improve energy independence. WSDOT is directed to encourage electrical vehicle (EV) use, expand the EV network, and improve multimodal planning to chart the path to a "multimodal, coordinated, cost-effective, safe and low-carbon transportation system."

Washington's Integrated Climate Response Strategy

Published in 2012, the [response strategy](#) lays out a framework that decision-makers can use to help protect Washington's communities, natural resources, and economy from the impacts of climate change. WSDOT's vulnerability assessment and the recommendation to consider climate in plans and projects are among the actions contained in the state's strategy.

Healthy Environment for All (HEAL) Act

The 2021 Legislature passed the Healthy Environment for All Act (also known as the HEAL Act), codified in RCW 70A. This landmark environmental justice law centers communities most affected by pollution as Washington transitions to a green economy. The HEAL Act defines 'environmental justice' in state law, outlines how state agencies should consider community needs and environmental justice (EJ) in their work. The law specifically discusses the need to examine how climate change will impact overburdened communities; and directs agencies to look at how state investments influence how well a community is able to respond and recover from the impacts of pollution and climate change.

Move Ahead Washington transportation package

The 2022 Legislature passed the Move Ahead Washington transportation package that invests \$16.8 billion in our agency over 16 years. This package, combined with significant climate commitments made in the prior legislative session, constitutes a massive shift toward sustainable transportation. "Transportation is our state's largest source of greenhouse gas emissions. There is no way to talk about climate change without talking about transportation," Inslee said during the Friday morning signing event. "This package will move us away from the transportation system our grand-parents imagined and towards the transportation system our grand-children dream of." The package also includes a significant infusion of funding for removing hundreds of fish passage barriers along state highways that block approximately 650 miles of habitat for salmon and steelhead. This work is important to meeting the state's salmon recovery commitment to Tribes. WSDOT's fish passage projects provide increased resiliency of our water crossings. These nature-based designs apply the best available climate science and are expected to withstand future increased rainfall and intense storms.

Definitions and Terminology

Except where otherwise noted, these definitions are based on Intergovernmental Panel on Climate Change's (IPCC) *Climate Change 2007: Impacts, Adaptation and Vulnerability Report*¹ and their *Climate Change 2007: Mitigation*.²

Adaptation – Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.

Adaptive Capacity – The ability of a system to adjust to climate change to moderate potential damages, to take advantage of opportunities or cope with the consequences.³

Climate – The long-term average of conditions in the atmosphere, ocean, and ice sheets and sea ice described by statistics, such as means and extremes.

Climate Change – A significant and persistent change in the mean state of the climate or its variability. Climate change occurs in response to changes in some aspect of Earth's environment: these include regular changes in Earth's orbit about the sun, re-arrangement of continents through plate tectonic motions, or anthropogenic modification of the atmosphere.

Climate Forecasts and/or Projections – A prediction about average or extreme climate conditions for a region in the long-term future (seasons to decades). Pacific NW climate projections are available from the Climate Impacts Group at the University of Washington: <http://cses.washington.edu/cig/fpt/ccscenarios.shtml>.

Climate Variability – Natural changes in climate that fall within the normal range of extremes for a particular region, as measured by temperature, precipitation, and frequency of events. Drivers of climate variability include El Niño.

Weather Forecast – A prediction about the specific atmospheric conditions expected for a location in the short-term future (hours to days).

Global Warming – The observed increase in average temperature near the Earth's surface and in the lowest layer of the atmosphere.

Resilience – The capacity of a system to absorb disturbance and still retain its basic function and structure.

Vulnerability – The degree to which physical, biological, and socio-economic systems are susceptible to and unable to cope with adverse impacts of climate change.⁴

¹ Accessed at <http://www.ipcc.ch/ipccreports/ar4-wg2.htm>, 9/20/2010.

² Accessed at <http://www.ipcc.ch/ipccreports/ar4-wg3.htm>, 9/20/2010.

³ IPCC 2001; also referenced in 2009 California Climate Adaptation Strategy.

⁴ AASHTO, Primer on Transportation and Climate Change, 2008.