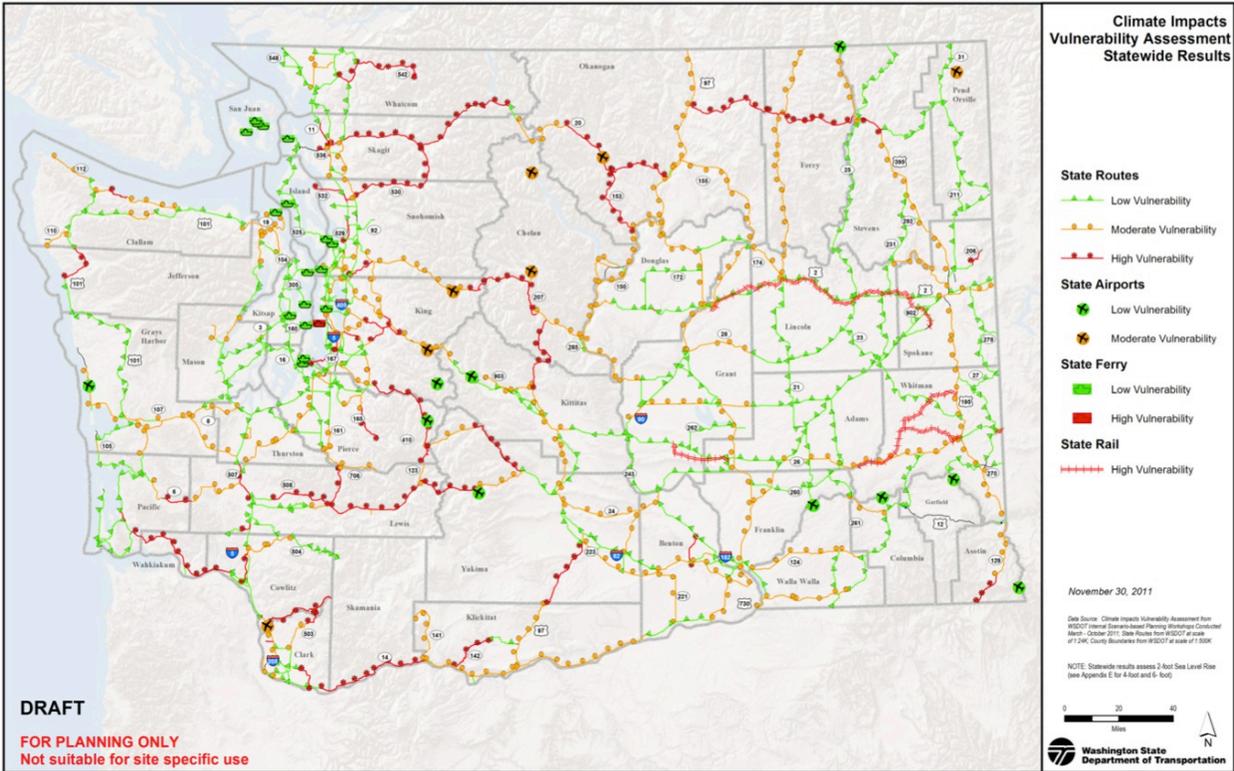


# Guidance for NEPA and SEPA Project-Level Climate Change Evaluations



## Introduction to the 2014 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 2014 update aligns with the clean energy and climate resiliency policy direction from Governor Inslee and Secretary Peterson's **Results WSDOT**. We also examined the policies and directives of our federal funding partners within the U.S. Department of Transportation. This updated guidance is fully consistent with and encouraged by the 2014 DOT Climate Adaptation Plan, which is available at:

<http://www.dot.gov/sites/dot.gov/files/docs/2014-%20dot-climate-adaptation-plan.pdf>

Prior versions of this guidance combined the topics of greenhouse gases and climate impacts in one guidance document. Based on feedback from our project teams, we developed two separate companion documents:

1. *Guidance for Project-Level Greenhouse Gas Evaluations for NEPA and SEPA*, which is housed on the WSDOT Energy webpage at:  
<http://www.wsdot.wa.gov/environment/air/energy.htm>
2. *Guidance for Project-Level Climate Change Evaluations for NEPA and SEPA*, which is housed on the WSDOT climate adaptation webpage at:  
<http://www.wsdot.wa.gov/sustainabletransportation/adapting.htm>

For help applying this guidance, contact WSDOT Environmental Services Office (ESO) staff:

**Carol Lee Roalkvam**

Policy Branch Manager

(360) 705-7126, [Roalkvc@wsdot.wa.gov](mailto:Roalkvc@wsdot.wa.gov)

## Guidance

WSDOT prepares environmental documents in compliance with national and state environmental policy acts (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.

The 2014 DOT Climate Adaptation Plan commits USDOT to a series of planning and asset management actions to ensure:

“Federal transportation investment decisions address potential climate impacts in statewide and metropolitan transportation planning and project development processes as appropriate in order to protect federal investments. Through such actions, transportation systems will gradually become better prepared for future climate shifts.”

The Council on Environmental Quality (CEQ) recently clarified the following in a letter dated August 7, 2014 (*CEQ's Response to a Petition for Rulemaking and Issuance of Guidance to Require Inclusion of Climate Change Analyses in NEPA Documents*), page 6 of 10 at: <http://www.crowell.com/files/ceq-8-7-2014-letter.pdf>

“Moreover, revisions are unnecessary because NEPA and its implementing regulations already require Federal agencies to evaluate the reasonably foreseeable environmental impacts of their actions, including foreseeable GHG and climate change implications. Courts have found that GHG emissions and climate change issues need to be analyzed under the existing NEPA statute and regulations.”

USDOT Secretary Ray LaHood issued an executive order in June 2011 directing all USDOT agencies to consider climate change impacts. WSDOT has the support of our primary funding partners, the Federal Highway Administration and Federal Transit Administration, to include consideration of climate change in project-level NEPA documents. More information about USDOT agency-specific actions can be found at:

[http://www.fta.dot.gov/12347\\_14013.html](http://www.fta.dot.gov/12347_14013.html)

[http://www.fhwa.dot.gov/environment/climate\\_change/adaptation/](http://www.fhwa.dot.gov/environment/climate_change/adaptation/)

This guidance directs how WSDOT's environmental review documents should consider the projected climate change for our region. The basic source of climate information that we rely on is 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. In addition, WSDOT staff conducted a statewide vulnerability assessment of all WSDOT's assets to assist project teams and transportation planners (more 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 use of this guidance is recommended, but not mandatory, for federally funded local agency projects processed by the Highways and Local Programs Division of WSDOT.
- While this guidance satisfies WSDOT’s responsibilities for disclosure related to the NEPA and SEPA processes, it does not apply to documents prepared to satisfy the federal Endangered Species Act.

The Environmental Services Office 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. Contact WSDOT’s Environmental Policy Branch Manager for more information.

## What is WSDOT’s position regarding climate change?

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. Recent strategic efforts at the state and agency level support realization of that vision.

### **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 will also contribute 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.*”

### **Results WSDOT: Moving Washington Forward**

WSDOT’s Strategic Plan for 2014–2017, “[Results WSDOT](#),” frames future agency actions to ensure WSDOT is the leader in providing a sustainable, integrated, and multimodal transportation system. It calls on WSDOT employees to be innovative and demonstrate that we are trustworthy leaders. Results WSDOT links agency actions to the six goals outlined in the Strategic Plan:

1. Strategic Investments
2. Modal Integration
3. Environmental Stewardship
4. Organizational Strength
5. Community Engagement
6. Smart Technology

Of particular importance to this guidance is Goal 3: Environmental Stewardship, “Promote sustainable practices to reduce greenhouse gas emissions and protect natural habitat and water quality.” The outcomes, strategies, and actions under this goal tie directly to this guidance:

- Improve environmental conditions: leave it better than before
- Reduce WSDOT’s overall carbon footprint
- Improve energy efficiency of transportation systems and WSDOT operations

WSDOT is fully committed to long-term asset management. The department’s senior managers have been briefed on the changes expected in the Pacific Northwest and were authorized to study our existing asset vulnerabilities (completed in November 2011) as well as the analysis of climate risks during planning and design of improvement projects.

WSDOT acknowledges that the effects of climate change may alter the function, sizing, and operations of our facilities. To ensure our facilities can function as intended for their planned 50-, 70-, or 100-year lifespans, 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.



*Drilled shafts support new bridge at Gold Creek on Interstate 90*

## How should projects consider future conditions related to climate change?

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.

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

<i>Projected Climate Change</i>	<i>Potential Impacts on State Highways, Rail, and Ferries</i>
<ul style="list-style-type: none"> <li>• Increase in average winter precipitation and more extreme precipitation</li> <li>• Change in timing of precipitation (more rain, less snow)</li> <li>• Change in storm track with some extreme storms with higher than normal snow accumulation</li> </ul>	<ul style="list-style-type: none"> <li>• More rock fall, mudslides, sink holes, road bed failure</li> <li>• Increased large-scale river flooding</li> <li>• More localized flooding due to poor drainage or higher groundwater table</li> <li>• Severe wind-related road closures</li> <li>• Blown-down trees, signs</li> <li>• Less snow removal, on average (some extreme snows)</li> </ul>
<ul style="list-style-type: none"> <li>• Sea-level rise, higher storm surge</li> <li>• More frequent and extensive inundation of low-lying areas (both temporary and permanent)</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal erosion and landslides weaken roadbed and bridge footings</li> <li>• Damage to stormwater drainage and tide gates</li> <li>• Saltwater corrosion of facilities</li> <li>• Detours around frequently flooded coastlines</li> </ul>

WSDOT also expects its NEPA specialists and technical experts to understand that climate science also changes how we describe the “affected environment” in NEPA. In the draft national guidance (CEQ 2010), federal agencies and project proponents are encouraged to consider the effects of climate change when evaluating projects “designed for long-term utility” in areas that are “vulnerable to specific effects of climate change.” That means that project teams need to examine the future affected environment differently 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 the question, “**how will my project be affected by climate change?**” Follow these steps:

1. Examine the results of WSDOT’s 2011 *Climate Impacts Vulnerability Assessment* for your project area. This information will alert you to vulnerabilities and/or strengths in the existing WSDOT facilities. (The report is available online at: <http://www.wsdot.wa.gov/sustainabletransportation/adapting.htm>)
2. Contact the WSDOT Environmental Services Policy Branch Manager, (360) 705-7126, for assistance in creating an up-to-date summary of climate threats in your project area.
3. Direct project technical specialists to consider the available information (steps 1 and 2) in their NEPA and SEPA analysis, as well as their proposals for mitigating impacts.
4. Document your findings regarding anticipated climate threats in the cumulative effects section (if separate) or in specific discipline sections (Fish and Wildlife, Wetlands, Land Use, etc.).
5. 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).

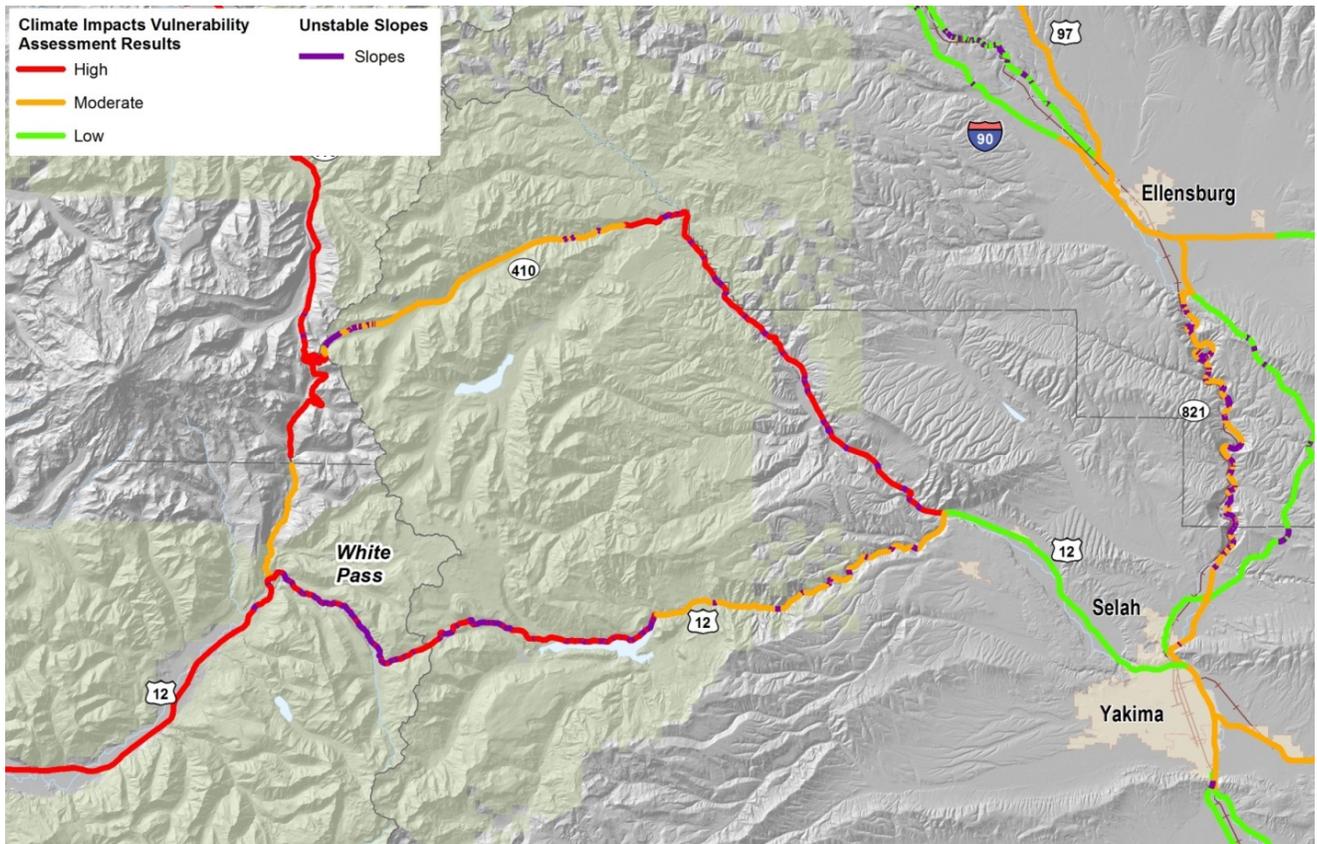
Project teams should look at the GIS layer (available through the GIS Workbench, under the Environmental Business Area). The data contains the comments from the workshops about the climate threats that lead to the ratings. WSDOT Environmental Services Office staff is available to help. The information is very easy to access and provides a useful starting place for project teams.

Below is a summary of WSDOT’s *Climate Impacts Vulnerability Assessment* (November 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.
- WSDOT leveraged its ten 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 is a qualitative assessment of the vulnerability agreed upon by participants.



Use the information in the vulnerability assessment alongside your knowledge of existing conditions. The map below shows GIS data on unstable slope areas with the qualitative ranking from the vulnerability assessment.



## Examples and Supporting Materials

### Example Language for Use in WSDOT Documents

#### NEPA CE (ECS form) and for SEPA Checklist

Climate data should be factored into the design of the proposed project.

#### WSDOT Recommended Standard Language for NEPA EA and for SEPA/NEPA EIS

Climate data should be factored into the design of the proposed project.

The standard qualitative language template below is recommended for the Cumulative Effects section of environmental documentation. This text should be tailored to your specific project. It is very important that project teams work with the **ESO Policy Branch Manager** (x7126) to tailor language prior to finalizing.

#### EA and EIS Template Language – Cumulative Effects Section

##### Answer the question: 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 snow pack, 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, ...)

## Considering Climate in NEPA/SEPA

Our new transportation investments hold the greatest opportunity to build climate-ready infrastructure. Future projects that are intended to last 70 to 100 years should integrate the climate science in planning and design.

We have published more than a dozen environmental documents that describe how the proposed project examined the results of the vulnerability assessment and what elements of the project improve resiliency. These projects provide benefits today and improve the likelihood that they will withstand extreme events in the future.

WSDOT's SR 522 US 2 to Cathcart Road Project was featured in the U.S. Government Accountability Office's (GAO's) *Climate Change & Infrastructure Report to Congress*. The GAO report highlighted the process that WSDOT used to consider climate and the resulting project design (improved natural drainage, reduced scour potential, deepened bridge footings):

<http://www.gao.gov/products/gao-13-242>

The following is an excerpt of that report (page 50).

“Washington State Route 522 and its Snohomish River Bridge are vulnerable to projected increases in precipitation and flash flooding, which may lead to increased bridge scour and roadbed damage. In 2008, the Washington State Department of Transportation completed environmental reviews for a major construction project along Route 522 to improve safety and reduce congestion. During the design, state officials integrated several measures in the project that both reduced the project's impact on the environment and increased its resilience to projected climate change impacts.

Figure 12 (below) illustrates some of the measures integrated into the project design. Specifically, at the Snohomish River Bridge site, engineers deepened bridge footings—the enlarged portions of bridge foundations that rest directly on soil, bedrock, or piles—to protect against the effects of changes in the flow of the river. Engineers also placed bridge piers at least 10 feet above documented peak flows and aligned the bridge at the least vulnerable location along the river. Furthermore, state transportation officials built five stormwater treatment areas and eight water retention ponds that will serve the dual purposes of controlling and treating storm water flows, and plan to increase the size of two drainage culverts, to (1) mitigate the project's impact on the surrounding environment by allowing wildlife to cross between habitat areas and improving fish access; (2) protect the roadbed by allowing greater amounts of water to flow more freely, preventing damaging roadbed saturation; and (3) increase the connectivity of waterways, which preserve natural drainage.”

**Figure 12 Adaptive Measures Integrated into Washington State Route 522**



Sources: Parametrix (map); Washington State DOT (wildlife crossing diagram); and GAO.

### ***Mukilteo Multimodal Project – EIS***

The project-level Draft EIS and the Final EIS (published in 2013) explain how climate was considered (page 4 of 136):

“The Mukilteo project team considered the potential impacts of climate change during preliminary design and the potential for changes in the surrounding natural environment. The current projected medium change in Puget Sound sea level is 13 inches by 2100, with a range of 6 inches to 50 inches (Mote et al. 2008). Overall, recent studies appear to be converging on projected increases in the range of 2 to 4 feet.

With help from PSRC, WSDOT developed maps showing a 2- and 4-foot sea-level rise in the project area. WSDOT then evaluated the potential for projected design measures to withstand the projected sea-level rise and increased storm intensity. Compared to the No-Build and Existing Site Improvements alternatives, the Preferred Alternative and Elliot Point 1 Alternative would provide more opportunities to accommodate sea-level rise by using fill to modify terminal elevation, locating access roads in upland areas, and locating facilities outside the 100-year floodplain. Both the No-Build Alternative and Existing Site Improvements Alternative are located within the 100-year Federal Emergency Management Agency (FEMA) floodplain, as are many of the surrounding land uses and connecting streets. This would make it more difficult to use fill to modify the terminal’s elevation to be above floodplain elevation. Other adaptive measures may be needed to address sea-level rise (additional details on floodplains are provided in Section 4.11 Water Resources). Other forecasted climate variables such as temperature and precipitation are within the wide range of climate conditions currently experienced in the project area.”



Mukilteo Final EIS – Appendix G Figure 8C. Preferred Alternative.

Viewpoint 8 (Simulation) from Second Street at Prospect Avenue View to the North

## 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*<sup>1</sup> and their *Climate Change 2007: Mitigation*.<sup>2</sup>

**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.<sup>3</sup>

**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://ces.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.<sup>4</sup>

---

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

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

<sup>3</sup> IPCC 2001; also referenced in 2009 California Climate Adaptation Strategy.

<sup>4</sup> AASHTO, Primer on Transportation and Climate Change, 2008.