



U.S. Department of Transportation  
Federal Transit Administration



# Central Puget Sound Regional Transit Authority Pilot Project Sound Transit Climate Risk Reduction Project

## Agency Overview

The Central Puget Sound Regional Transit Authority (Sound Transit) plans, builds, and operates express bus, light rail, and commuter train services throughout King, Pierce and Snohomish counties. Sound Transit is committed to examining the potential impacts of climate change because the agency's services currently operate in areas prone to mudslides, flooding, poor drainage, and storm surge. These events already contribute to service disruptions and increase maintenance and operating costs. A substantial body of peer-reviewed research shows that climate change could have potentially significant impacts in Sound Transit's service areas, which would continue to affect many aspects of agency operations, asset management objectives, and long-term system development.

## Goals and Objectives

The central goal of the project was to identify potential climate change impacts on Sound Transit operations, assets, and long-term planning; options for strengthening the agency's resilience to these impacts; and opportunities for integrating climate change considerations into agency decision making processes. The project also aimed to create a process and a model for assessing and planning for climate change impacts that is transferable to transit agencies across the United States, and to provide a state-to-local testing ground for Washington Department of Transportation's (WSDOT) pilot use of the Federal Highway Administration's (FHWA) climate change vulnerability assessment methodology.

## Key Pilot Project Findings

*The project found that climate change is likely to have minor to moderate impacts on many Sound Transit services, although potentially significant impacts are possible with higher rates of sea-level rise and mudslide activity.*

Climate change impacts were ranked as potentially minor, moderate, or significant. This ranking was based primarily on how a climate change impact could affect service delivery. The estimated probability of an impact occurring did not determine how it was ranked; however, probability was noted as an additional input to help inform decision making. Potentially significant impacts included those that could cause frequent extended (e.g., multi-day) or permanent service cancellations, require expensive infrastructure repairs or adjustments, and/or reduce customer confidence. Potentially significant climate change impacts for Sound Transit are associated with high rates of mudslide activity and sea-level rise. Minor to moderate increases in the frequency of mudslides and sea-level rise are likely to result in less significant impacts but could still affect services in ways that may require adaptive action.

Potentially moderate impacts are those that could cause occasional (e.g., occurring every few years or longer) multi-day service cancellations, frequent moderate-length service delays (e.g., in the range of hours) and cancellations, increased maintenance, moderate structural repairs, and customer service issues. Potentially moderate climate change impacts for Sound Transit are increased river flooding, increased localized flooding due to more stormwater runoff, or poor drainage, and rail buckling. Potentially minor impacts are those that could cause frequent short-term (e.g., less than an hour) service delays and cancellations, increased minor maintenance, minor structural repairs, and minor (if any) customer service issues. Potentially minor climate change impacts for Sound Transit are heat-related impacts on electrical equipment, the overhead catenary system, facility structures and landscaping, and environmental mitigation activities. Increased groundwater seepage into tunnels is also a possibility. The report identified more than 70 possible options for action if and when Sound Transit determines that adaptation is warranted. Deciding when, where, and how to adapt ultimately will depend on the nature of the climate change impacts and vulnerabilities that need to be addressed, how quickly climate changes, individual and institutional risk tolerance, ownership of the potentially affected infrastructure, available resources, and other factors. Effective adaptation will require integrating adaptive thinking into Sound Transit agency processes.

## Next Steps

Sound Transit has an unprecedented “window of opportunity” to address potential climate change impacts in a rapidly-expanding system. The agency is currently implementing ST2, a 2008 voter-approved regional transit expansion plan to better connect the region’s busiest population and job centers. Many aspects of this expansion are currently in the planning and design stages, providing a unique window of time to integrate information on potential climate change impacts into long-term planning and asset and risk management decisions. To accomplish this, Sound Transit staff will disseminate project findings to build awareness of the project’s results within the agency and maximize its value as a template for use by transit agencies nationally and will prioritize next steps to address the report’s major findings by developing a formal set of recommendations for agency action.

## About FTA’s Climate Change Adaptation Pilot Program

FTA provided just over \$1 million in research funding for seven pilot projects (nine agencies) to conduct climate change adaptation assessments from 2011–2013. The main objective of the pilot projects is to advance the state of practice for adapting transit systems to the impacts of climate change. The selected projects assessed the vulnerability of transit agency assets and services to climate change hazards and developed initial adaptation strategies. The findings from the pilot projects can be applied to various size transit agencies nationwide in order to make systems more resilient and adaptable to future climatic hazards.

### Project Information

#### FTA Report No. 0075

This research project was conducted by the University of Washington Climate Impacts Group and Sound Transit. For more information, contact Kimberly Gayle, Director, FTA Office of Policy Review and Development, at (202) 366-1429, [kimberly.gayle@dot.gov](mailto:kimberly.gayle@dot.gov). All research reports can be found at [www.fta.dot.gov/research](http://www.fta.dot.gov/research).