

- Risk-Based Benefit-Cost Approach to Prioritizing Climate Change Adaptation Strategies
(Erik Cempel, Joe Guerre - Cambridge Systematics)

The goal of *NCHRP 20-83(5) - Climate Change and the Highway System: Impacts and Adaptation Approaches* is to provide insights, guidance and tools to mitigate the risks of climate change impacts on the nation's highway systems and related intermodal facilities. A diagnostic framework was developed to assist transportation agencies in making decisions on climate change adaptation strategies; it includes a benefit-cost methodology that an agency can use in determining the present value of various adaptation actions. The benefit-cost ratio for an identified strategy is weighted by the likelihood of asset failure, which is based on a combination of the probability of an event occurring and the ability of the infrastructure to withstand the event. This methodology includes a risk assessment that accounts for an asset's current ability to withstand an event, and its ability to withstand it after an adaptation strategy has been implemented. In addition to standard infrastructure costs, agency and user costs of asset failure are also considered. The recommended approach was intended to allow each agency to apply its own data and customize as necessary. Ultimately, this risk-based approach can be applied in regards to any uncertain events that may impact infrastructure investments, independent of their correlation to climate change.