Infrastructure in the United States will be significantly impacted by climate change. Every sector including transportation, water/wastewater, public buildings, energy, and coastal areas will experience impacts that require increased maintenance and interrupt service. Damages to infrastructure associated with climate change are projected into the hundreds of billions of dollars by 2050. Decisions made today concerning whether to invest in climate adaptation or risk waiting for the incurred damages will have impacts for generations to come.

The Infrastructure Planning Support System (IPSS) is a peerreviewed, quantitative, engineering-based analysis tool that provides decision-makers with the economic risks to infrastructure associated with climate change. IPSS quantifies the potential maintenance costs due to climate change as well as the potential return on investment from adaptation in the transportation, building, water and energy sectors. IPSS provides decision makers with the ability to analyze portfolio and individual investments across multiple climate stressors and multiple climate scenarios.

IPSS analyzes the specific effects of changes in the environment against individual infrastructure components. The result is an analysis that provides guidance during the planning and budgeting process as to which infrastructure elements require further analysis and which represent the greatest financial threats. By determining future climate changes— stressors—that will negatively impact infrastructure, IPSS analyzes the specific impacts those stressors will have on the infrastructure in question to quantify a fiscal cost and risk, according to the resilience strategy employed.

WHY

Resilient Analytics has demonstrated through work in over 50 countries and for entities ranging from county governments to international banks how climate change risks can be identified, and adaptation planning needs evaluated. IPSS goes beyond indicating whether it will be getting hotter or wetter in a specific area. IPSS provides the key financial impacts and risks associated with changes to energy demand, infrastructure availability, transport failures, and system interruptions. From Florida to Colorado and from the United States to Africa, these insights have directly led to enhanced resiliency.

WHAT

IPSS can be run at either the portfolio level or an individual asset management level. **IPSS** can analyze inventories of thousands of elements or individual sites with specific assets. IPSS can be utilized with a complete set of built-in costs and adaptations or customized to meet specific requirements. IPSS utilizes a suite of climate models to establish future variations in aspects of climate such as temperature, precipitation and flooding for each asset location. The combination of asset analysis and climate models provides the flexibility to utilize IPSS either at a planning or operational mode.

HOW

IPSS utilizes an easy-to-use set of spreadsheets to enable any user to develop climate impact estimates. Climate specialists and decision makers at all levels can equally utilize the IPSS system and produce desired outputs. Outputs can be customized to encompass maps, spreadsheets, or detailed graphics. Resilient Analytics works with each user to develop the outputs that meet specific needs. Whether it is short-term estimates or long-term planning scenarios, **IPSS** provides the information and analysis required to make informed climate resiliency and adaptation decisions.



LEVELS





THE INFRASTRUCTURE PLANNING SUPPORT SYSTEM (IPSS)





ADAPTATION STRATEGIES



SEA LEVEL RISE IMPACTS



COST IMPACTS



TOOLS



NATIONAL HEAT STUDY

CLIMATE SCENARIOS

PROJECT TITLE	SPONSOR	DATE	PROJECT ABSTRACT
National Cost Impact of Climate Change	Canadian Institute for Climate Choices	2020	Project specialists for cost impacts on a national level for roads, rail, and bridges.
Community Climate Impact Studies - Florida	Bay Harbor, FL Bal Harbor, FL	2019- 2020	Provide detailed impact analysis for infrastructure to local communities in Florida including impacts to roads, buildings, and bridges.
Water Infrastructure Impact Study	Association of Metropolitan Water Agencies	2019- 2020	Analysis of temperature impacts to water utilities in five cities including worker impact and physical infrastructure impact.
Lake Tahoe Vulnerability and Risk Analysis	California Tahoe Conservancy	2019	Provide analysis for Lake Tahoe Basin on broad infrastructure vulnerabilities including bike trails, roads, transmission capabilities.
Economic Impact of Infrastructure Interruption	EPA	2018- 2019	Provide interruption analysis for roads and rail infrastructure throughout the US for integration with economic analysis.
Sea Level Rise Impact on Coastal Communities	Center for Climate Integrity	2018- 2019	Develop an engineering approach to determining impacts on transport systems and buildings in coastal communities from sea level rise and storm surge.
Climate Impact Analysis of Boulder County, CO	Boulder County	2017- 2018	A multi-sector analysis of climate change impacts and adaptations for Boulder County including transport, health, drought, and wildfire impacts.
Vulnerability of the US Rail, Bridge and Road Networks to Climate Stressors	US EPA	2016- 2017	Analyze the effect of climate change on the primary rail and road networks in the contiguous 48 states. Analyze the 500,000 bridges in the national bridge database for vulnerability to climate change.
Hillsborough County Coastal Analysis	Hillsborough County, Florida	2016, 2018	Provide input on adaptation options for redesign of coastal road assets.
Analysis of Climate Impact on Alaskan Infrastructure Resilient Analytics	US EPA	2015- 2016	Analyze the impact of climate change on the broad set of Alaskan infrastructure including the impacts of potential permafrost thaw.
Africa Climate Change Impacts on Road Infrastructure	World Bank	2013- 2015	Analysis of climate impacts on proposed African investments in Sub-Saharan Africa. Using the IPSS tool to analyze proposed projects through 2050.